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A NOTE FROM THE EDITOR

Events of the last two years or so in the USSR have attracted attention worldwide for different reasons. In India, some see in them the end of an experiment in human history, or the end of the era of ideology, or the demise of a one-party dictatorship, or even the ultimate triumph of democracy and the free enterprise. Varied as these interpretations are, they nevertheless reveal the dimension of the change that is taking place in the USSR. Indeed, the nature and magnitude of the change and the manner in which the need and desirability of the change is voiced, need to be appreciated critically from an Indian perspective.

The striking feature of the upheaval is the demand for doing away with or writing off the entire period in the Russian history after the October Revolution. Such a demand has also taken the shape of assertion of a Russian identity which views the structures created since the Revolution and the ideology of Marxism as culturally alien impositions on the people of Russia which should be given up without a second look. This trend - shall we call it the "anti-Western trend" - has deep roots in the history of Russia since the times of Peter "the Great", who initiated processes that aimed at the transformation of Russia

into a Western (as opposed to a Slavic or Eastern) country. The debate between "the Westernisers" and the others was kept up throughout last century and was put an end to with the rise of Lenin, the greatest of the Westernisers, to power. Many literary figures in the past and in the present (Solzhenitsyn, for example) have voiced their dissent by way of assertion of the superiority of a Russian identity over that of the Western image of Man. (It is even said that such a division goes back to the times when the Eastern Church and the Roman Church were contenders for real power).

The situation and the trend of change in Russia has definite significance in our own situation. There was, at the time of Independence, an atmosphere in this country when the need and the manner of doing away with the structures and ideas created during the six or seven generations of European domination could be debated. The opportunity was lost. And the events in the USSR today do affirm that writing off of a part of history is not altogether an unviable concept and can indeed be a point of constructive debate. The contribution by Dharampal may be viewed in this perspective.

In *Hind Swaraj*, the harshest indictment of the Western Civilization is directed against the forms of political institutions, such as parliamentary democracy, which are considered its most enlightened aspects. In a different manner and level of comprehension, the Movement for Total Revolution under the leadership of Jayaprakash Narayan suggested adoption of partylessness in politics as a basic creed. This is one of the recurrent, if somewhat concealed and inaudible themes expressed in India, that the party politics as form of mobilisation and human combination is perhaps not suited to the genius of the country. However, party politics is only one end of the spectrum of mobilisation techniques all of which have the common idea of legitimacy and desirability of bringing people together on the basis of specific interests as a means of activation. People may be brought together as "Fan's Associations" or clubs or unions or as parties, but the core idea behind these forms is the same. This has never been questioned quite openly, particularly by those who call themselves radicals, and on the threshold of '90s, after we have experienced large-scale non-party mobilisations in the country (starting with the students' movement in Assam in the late '70s) over the last decade, we would do well to consider a serious review of the assumptions which make up our idea of politics as a means of mobilisation of people. Sunil Sahasrabudhey's article

Swadeshniti takes us further in this direction.

Introduction of a package of agro-technological practices and economic measures in the mid-sixties constitutes a watershed in the development of Indian agriculture. Some of the social scientists who carried out the evaluation of this package of practices - Green Revolution (GR) as it is called - in the 70's concluded that the economic consequences were such as to enhance disparities in the countryside. (Since then, this critique has been incorporated in the current set of practices broadly termed "Farming Systems Research"). PPST was among the first to point out that the decadal change in productivity growth during 1966-67 to 1977-78 was less compared to the earlier decade. (It is argued now, of course, that the 20 year change in productivity growth from 1967 to 1988 is higher than that in the pre-Green Revolution phase!). The reduction in the biological productivity of the farm, reduction in the input productivity in the post-GR phase, the unsustainability of revolutionary yields in GR agriculture etc. are now widely appreciated. The trend now is to establish an agro-technological complex with "sustainability" rather than mere "yield improvement" as the motive force. The coming decade may well be the sustainability decade.

In other words, we seem to be at the threshold of a technological change in agriculture which can affect the lifestyles or survival of crores of people. This is almost within 25 years of a large-scale technological change called the Green Revolution. It has been argued that our population could not adequately cope with the change brought about through GR, because the pace was rapid, there were too many changes, many dictated from outside the country and so on. In such a background, we consider it almost imperative for us to understand the nature, extent, character and pace with which the transition may take place and thus to aid in comprehending how we may cope with it.

This calls for a detailed review of food and agricultural policies in the country over the last four decades and a comprehensive assessment of the techno-economic organisations and linkages that have been built up in Indian agriculture, besides developing a serious appreciation of the resourcefulness of the community in dealing with agriculture. This is a task

which may be multi-dimensional in character, and may need a high-powered body (a Second National Commission on Agriculture?) to carry out the analysis within a short span of time. We intend to initiate the process in whatever limited way we can. Consistent with our focus on the technological aspect of agricultural changes in recent times we find that the agricultural research, education and extension organisations have played a major role in promoting GR in this country; in a sense, their importance in running the "delivery system" may be considered to be even more central than those of organisations such as the DSIR. How the whole system of agricultural research was reorganised or structured to play roles affecting large mass of population is the main topic of the interview with Dr. M.S. Swaminathan, which appears in this issue. In this interview, our interest has been to understand, through a personal account, how a research system as a strategy-maker in agriculture mediates between the scientists and the beneficiaries and how the impact of GR is viewed from within the complex of agricultural research.

Dear Editor,

I write in response to the article by M.D. Srinivas (in the June 1990 issue of the bulletin) entitled "Indian Approach to Science: The Case of Jyotihshastra".

I am rather puzzled by this article. It is not clear what the author is trying to achieve (The author being a friend, I shall henceforth refer to him as M.D.). The stated aim is clear; it is to explain the Indian approach to Science. However it quickly becomes obvious that no attempt will be made to explain Indian Science in its own terms. Instead, it will be used as a convenient prop to do battle with Western Science. Seen in this light, the article makes more sense. Now I would like to put down some detailed comments.

The basic point according to M.D. seems to be that Indian Science did not search for the ultimate truth. Instead, it was aimed at furthering practical activities concerned with living in the material world. In contrast, it is suggested that Western Science has been driven by the search for ultimate truth.

I feel that M.D. is choosing the most convenient interpretation of Western Science in order to be able to attack it. There is no single philosophy of Western Science. More importantly, a philosophy of science does not have much to do with the actual

practice of science. No doubt, such a philosophy may provide, after the fact, an illuminating analysis of a long stretch of scientific development. However, it is rarely the case that scientists first arm themselves with a philosophy and then start pursuing science in accordance with this philosophy. In particular, I doubt very much that practitioners of Western Science go into their laboratories or wherever every day in search of the ultimate truth. One might of course argue that these poor souls are doing so without being aware of the fact. What I would like to suggest is that these scientists (or their contemporaries who pursue philosophy), when asked to explain the underlying nature of scientific work, often come up with empty nonsense which is designed to sound impressive. One of the popular pieces of such nonsense is the search for the ultimate truth.

A second difficulty I have with M.D.'s view of Western Science is that it does not explain its applications. We all know, to our peril, that Western Science does have its applications. Perhaps one is supposed to view practical applications of this science as accidental side effects; applications come about in spite of the fact that the actual game is the search for the ultimate truth.

Turning now to Indian Science, M.D. repeatedly insists that a crucial feature of this science was that corrections and

modifications were carried out whenever the theory deviated too far from observations. Well, this is good to know. I would have been disappointed if it had turned out that the Indian approach to science consisted of evolving theories which would progressively deviate away from observations. But I find it hard to believe that this feature is unique to Indian Science.

It is possible that I have read too much into the predominant position given in the article to this aspect of Indian Science. Perhaps the real point is that Indian scientists were able to reconcile and live with different schools of thought pertaining to a single discipline. In support of this view M.D. points to the case where Aryabhata proposed the diurnal rotation of the earth as opposed to the then prevailing model of the same phenomenon. M.D. suggests that instead of trying to resolve which of these two models was the true one, (as it would have presumably been the case in the West) Indian astronomers continued to refine both the models.

My question is : Why did Aryabhata propose a new model in the first place? This question is relevant because in an earlier citation attributed to Brahmagupta, it is said: "The methods expounded by Aryabhata are generally impracticable for every calculation". It would be interesting to determine what motivated Aryabhata to depart radically from the traditional model and create a new one which, in the first instance, was apparently not very ap-

plicable. It is to be hoped that the great Aryabhata was not tainted with Western modes of scientific thought. More seriously, it is again not clear to me that the ability to live with different schools of thought is unique to Indian Science.

To conclude, my reading of the article suggests the following. The article is an arbitrarily chosen fragment of a long argument. The argument is between Indian Science and Western Science. The guiding principles for this argument are mutual contempt and dislike. I wish M.D. had made it clear that this is what the article is about.

Dr. P.S. Thiagarajan

SPIC School of Mathematics Foundation
Madras

Dr M.D. Srinivas replies:

I am glad that my note on the Indian Approach to Science has drawn some response, even if it be from my friend Thiagu (Professor P.S. Thiagarajan). While I cannot blame Thiagu for seeing that note as an "arbitrarily chosen fragment of a long argument", I am at a total loss as to how he could see it as a "prop to do battle with Western Science" or as some sort of an argument "between Indian and Western Science ... (where) the guiding principles ... are mutual contempt and dislike". For, Western Science or its

philosophical foundations are referred to only tangentially in my note.

The purpose of my note was to point out some of the salient features of Indian approach to Science and contrast them mainly with the kind of assumptions most of us, modern Indians, have been victims of in recent times. Occasionally I have emphasised one feature or the other where the Indian approach does seem to differ significantly from that in the West - like for instance the fact that it was *vyavahara* or the mundane applications, and not the urge to arrive at truer models of Universe, which was the corner stone determining "progress" in Indian Sciences.

Most of the points raised* in my note were actually in relation to contemporary Indian myths that "Science is a disinterested enquiry into the nature of the Universe", "Scientific theories seek to discover the true picture of reality", "Science is the activity of a few truth seekers some what in the image of ancient Indian Rishis" etc. Many of these myths might have their origin in the European thought of the 19th century, but have struck deep roots in our minds and have to some extent contributed to our failure in re-establishing a meaningful and creative scientific activity in this country.

Here, I must emphasise that "disinterested enquiry into the nature of reality" or "search for absolute truth" have been accorded a high status in our civilization. But traditionally these were not the job of our sciences or of our scientists *qua* scientists. Chakrapani Datta the 12th century commentator on *Charaka Samhita* stresses the distinction between *jnana* (which he explains as *Adhyatma jnana*) and *Vijnana* (which he explains as *Sastrajnana*). As has been noted by Jitendra Bajaj in his article on Francis Bacon in PPST Bulletin No.9, this clear and careful distinction goes back to the *Isopanishad* which talks of the of *Vidya* and *Avidya* while emphasising that both are indeed essential.

Though in my note I did not present any analysis of the Indian approach to Science in comparison with those of other civilisations, I do feel that we in India should undertake such a study in a major way, especially in relation to the approach to Science in the Graeco-European tradition and in the modern West. I am sure that most of us agree with the kind of assessment made by modern scholarship that West has become the reference point of "modern Indian self-understanding and self-articulation" and even of our "rejection of or..self affirmation against, European ideas and orientations"* But we should also realise that the ghost of the West cannot be exorcised except by our striving for a

* Wilhelm Hallifass : *India and Europe : An Essay in understanding*, Delhi 1990 (Original German Edition 1981) Page 369.

much deeper knowledge and comprehension of the core or foundations of the Western Civilisation as well as ours. I am sure I can call upon not only friends such as Thiagu, but also most other distinguished members of Indian Academia to contribute in this task with all their talent.

Department of Theoretical Physics
University of Madras
Madras 600 025.

Dear Editor

Mukundan's article 'The Traditional and Modern Approaches to Iron and Steel manufacture in India' (issue No.19 & 20, June 1990) brings to light several interesting aspects of the iron and steel industry in India. The contrast between the preeminent position of the steel produced by Indian smelters and blacksmiths in the pre-British days to the present day ailing industry adopting modern technology gives food for thought. In his article, Mukundan has discussed some of the sociological aspects too, which itself should be a subject for investigation. The present communication is aimed at presenting a few observations from an engineer's view point.

The traditional process of making iron 'blooms' in low shaft furnaces as practised in the 18th century India (and elsewhere in the world before the industrial revolution) differs conceptually from the modern day iron-and steel making processes in

several respects. A few of these differences are discussed below to illustrate this point.

There are two primary routes for making steel from iron ore in the modern day industry. The established route producing bulk of the steel in the world employs the blast furnace (BF), where iron ore is reduced with coke, obtained from coking coal, and fluxes. The furnace has a tall shaft wherein high temperatures are achieved. The products melt when passing through the high temperature zone, resulting in the separation of the gangue as a liquid slag. However, the liquid metal is brought into intimate contact with this slag and picks up several other solutes like sulphur, silicon, manganese and phosphorous apart from being almost saturated with carbon. The product is a highly impure form of iron called pig iron, which then needs extensive refining in a steel-making furnace. This route is the BF-LD route.

The second route, which is gaining ground in India in recent years, is the direct reduction - electric arc furnace (DR-EAF) combination. Here the ore is reduced with a suitable reductant at comparatively low temperatures wherein the iron oxide gets reduced, but the product remains solid and therefore the gangue is not removed. This 'directly reduced iron' (DRI) is then melted with suitable fluxes, and some steel scrap, in an electric arc furnace, where both the metal and the gangue are melted. The metal at this stage has a tendency

to pick several impurities from the slag and is still necessary in the EAF to obtain steel of requisite quality. This process of first increasing the impurities in the liquid metal then decreasing it by refining leads to the chemistry typical of modern day steel.

The traditional bloomery process, on the other hand, involves a skillful management of the temperatures in the furnace so that the gangue is fluxed with iron oxide and flows out as a liquid slag but the metal undergoes no substantial fusion. Any gangue which does not flow out, is squeezed out during hot forging into the final shape. The metal chemistry therefore is substantially different from the modern day steel. The metal is very low in silicon, sulphur (due to the use of charcoal) and usually carbon, but high in phosphorous.

Another difference of technological importance is the fact that in both the BF and the DR processes, the reduction is carried out under constant pressure/gas flow velocity conditions. In the traditional process the use of bellows for air supply results in a pulsating pressure/flow condition in the charcoal/ore bed. It is well known that pulsating flow around a reacting particle enhances gas-phase mass transfer. There is further some evidence to show that pressure fluctuation should enhance mass transfer through porous bodies resulting in enhanced rates of reactions (1,2). This fact has relevance in the modern day context too.

The pattern of resource utilization in the two sectors are also quite different. The traditional process employed charcoal as the reductant as well as fuel for the forge, and the amount needed may be anywhere between 3 to 5 kg per kg of iron produced. This in comparison with the modern day blast furnaces in India utilising 650 - 850 kg coke per ton of pig iron is definitely very high. The fact should however be noted that the traditional smelter had no other demand for energy. The ore is manually picked from the neighbourhood and the iron/steel is already fashioned into a ready-to-market product by the time it left his forge. In the modern industry the ore is mechanically mined, transported over great distances, typically crushed and processed into sinter/pellet at high temperatures and then fed into the furnace. The product from the steelmaking vessel is cast into large shapes, which then have to be shaped into final products by forming processes like rolling and forging in mechanised mills, intermediate reheating to high temperatures often being necessary. The products are to be transported over great distances to the customers.

The blast furnace requires the reductant to be in the form of coke prepared from coking coal. The scarcity of good quality coking coal in the country has therefore led to severe problems in the BF operation. The bloomery furnaces on the other hand uses charcoal traditionally. In the present context of depleting forest resources the uses of this fuel could be seriously objected

to. The use of low sulphur noncoking coals or lignite may however be a distinct possibility in these low shaft furnaces.

Both in the BF and the DRI processes much of the ore is prepared into sinters or pellets at some expense of energy and effort. Fines are normally not permitted. It is interesting to note that the traditional bloomeries freely utilised ore fines. In fact, the best quality ores were considered to be the iron sand obtained in river beds. Tolerance for fines may be due to the low height of the furnace. Moreover, in the pulsating flow situations the behaviour of fines may be entirely different from that in continuous flow. Due to smallness of scale, the traditional process also permitted exploitation of small deposits of ore distributed almost throughout the country. Due to the same reason, extensive wastage of the ore body as slime due to mechanised mining is absent.

In the matter of steel quality again there are some inherent differences. The bloomery iron normally gets much of its strength from the high content of phosphorous, as against carbon in modern day plain-carbon steels. The obvious advantage of phosphorous is the higher corrosion resistance which is very relevant in a tropical country like India. However, high phosphorous in plain-carbon steel is generally considered bad due to the temper brittleness it imparts. It is interesting to note that recently steel high in phosphorous and a small amount of niobium, but low

in carbon, nitrogen, sulphur, silicon, has been shown to have extremely good deep drawability.

The few facts mentioned above brings out the point that the process of making iron and steel through the bloomery process is qualitatively different from the processes well understood by the modern metallurgist. It should also be borne in mind that the processes became obsolete in the western world before they were analysed from the modern scientific view point. There is therefore a necessity to make a thorough study of the bloomery process from the metallurgists' point of view. The following methodology can be suggested for such a study:

1. Process reconstruction so that it can be studied for its technical merit.
2. Process evaluation in terms of resource utilization and the product quality and comparison with the modern steel industry in India.
3. Process analysis to understand its working and its optimisation.
4. Study of the suitability of adopting alternative fuels like lignite and noncoking coal and its effect on product quality.

The question of whether the process should be revived with the help of the tribal smelter or the traditional blacksmith for meeting the needs of the rural economy can only be answered after a thorough

investigation like the one mentioned above. The sociological benefit of such a revival is probably beyond doubt.

Prof.N.B.Ballal
Prof.H.S.Shankar

Departments of Metallurgical Engineering &
Chemical Engineering
Indian Institute of Technology,
Bombay 400 076.

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Rediscovering The Russian Self

A recent issue of *Moscow News* (No: 31, 1990) has announced the reprinting in the U.S.S.R. of *VEKHI* (Landmarks) first published in Russia in 1909. Its joint authors were: 1. Nikolai Berdayev, 2. Sergei Bulgakov, 3. Mikhail Gershezov, 4. Alexander Izghoyev, 5. Bogden Kistyakovsky, 6. Pyotr Struve, and 7. Semyan Frank. According to *Moscow News* V.I. Lenin termed it "An Encyclopaedia of liberal renegacy", and A. Solzhenitsyn, "A Message from the Future". The reprint is of 50,000 copies, by Novosti Publishers, and is priced 60 kopeks. The seven authors "believed that class struggle and social revolution were catastrophic for society. According to them, atheist materialism, political radicalism and violence, nihilism with respect to absolute values, maximalism of social and ethnic demands and utter disdain of individual interests were the characteristic features of democratic and socialist ideology which brought Russian society into deadlock".

According to *Moscow News*, "To oppose such ideology, the seven thinkers put forward their own positive programme which envisaged, in particular, that the democratic intelligentsia should take up responsibility for what was happening. They insist on self-improvement of the individual on the basis of religious and cultural values". Novosti Publishers are also to reprint a sequel to *Vekhi* by the same authors, first published in Moscow in 1918, and titled "From the Depths: Articles About Russian Revolution".

According to Alexander Tsipko (*Moscow News* 26, 1990), "No other publication in the Russian language can improve on *Landmarks* for its concentration of prophesies and ideas. Having brought together contribution by the most brilliant representatives of liberal and democratically minded Russian thinkers, this collection was labelled by Lenin the "encyclopaedia of Russian renegacy". In fact it is a book about our bloody post-revolutionary history written long before the revolution. *Landmarks* fore-told October 1917 in 1909. It also wrote about the Red terror and Stalin's terror, and about collectivisation". Tsipko adds, "No other book can give you a better insight into the Russian mind and soul. No other book can give you greater confidence in Russia's intellectual potential".

Elsewhere (*Moscow News*, 24 1990) Tsipko observes that, "The idea of Socialism, or of the socialist choice, can no longer cement the country's centre. Only a centrist, general

democratic ideology can strengthen the centre and bring together the extreme points of view. The future of Russia depends on solving this problem".

"Take the situation inside the Party. Understandably, the CPSU Platform with its declarations of fidelity to Socialist choice and to Lenin's principles of Party organisation is unable to unite anybody. To unite the reformers with the democratic forces will require fundamental human values, the assertion of the primacy of democracy, progress, the rights, freedoms and dignity of the individual, universal, human values". According to *Tsipko*, "Marxism did not maintain that the individual was valuable in and of himself", and "so we can do without Marx and his ideas of scientific communism".

But the *Vekhi* of 1909, or the sequel to it published in 1918, were not the last reservations on the Russian Revolution of October 1917, or the solitary expression of forebodings on the future to come. Forebodings of this future were powerfully expressed, among others, by *E.Zamyatin* in "We" published outside the USSR in 1924, and by *A. Platonov* in *Chevengur* (*USSR: Social Sciences Quarterly Review*, (SSQR), No.1, 1990, pp 141-162). In a large way these Russian writings of the 1920's seem to have inspired *Aldous Huxley* to write *Brave New World*, and *George Orwell* to write 1984. *We* and *Chevengur* have also recently been reprinted in the USSR.

According to SSQR, "throughout (*Zamyatin's*) novel runs his persistent thought about what happens when all render obeisance to the ideal of an absolutely expedient and rational existence. He shows what happens to the individual, the state and the human community when liberty is rejected for the sake of this ideal, and happiness is equated with servile subordination".

"In *Zamyatin's* work" observes the SSQR, "we were not the masses but a social quality. Any type of individuality whatsoever was excluded in the single state. The very possibility of becoming 'I' and in some way separating from 'We' was crushed. There remained only the faceless, enthusiastic mob which was easily moulded to the iron will of the Benefactor. The cherished idea of Stalinism was to transform the individual into a 'bolt' in the vast machine of state which was controlled by the firm hand of its engineer or driver. *Zamyatin* showed this idea in practice".

The SSQR further observes, "*Zamyatin* is now considered one of those writers who very easily recognised the outlines of the totalitarian system soon to become a reality in several different countries". *Zamyatin* even helped *Orwell* realise, "the main danger

presented by modern civilisation: that it demanded a constantly improving technology and values man least of all".

Platanov's *Chevengur* "grows out of the upturned reality of the first post-revolutionary years. Having purified life of all 'oppressive elements', the urge to build the road to communism with a single sweep of the hand and make a break with the 'mysteries of time' was no flight of the imagination but a widespread desire" of Lenin and his followers. As a hero of Platanov puts it, "people then wanted to become "'cleverer than reasons'". According to a student in *Chevengur* their course teacher told them, "We are stinking pastry but he will make a tasty pie of us".

The metaphor of the ordinary, and not so ordinary, people being like 'stinking pastry' to be transformed into a 'tasty pie' by the trainers, the educators, the political cadres and their masters seems to sum up the nature of events which succeeded in the capturing of power by Lenin, the great westerniser even more so than the Tsar Peter, and his adherents in Russia. Historically this was not new to Europe where the Norman conquerors and others had treated people much like 'stinking pastry' and had appropriated all power, resources and wealth into fewer and fewer hands. The main difference seems to be in nomenclature: the 11th century Norman dominance and state structures are classed as feudalism while what happened in post-1917 Russia became state socialism. The other difference may have been that the Normans, etc., did not even aspire to convert the 'stinking pastry' into a 'tasty pie'. They perhaps knew that such conversion could never be made. According to European scholars, ancient Sparta was one of the historical models of state socialism. The number of *Perioeci* (those inseparably bound with the body of the state) and *Helots* (those without any protection of law) in BC 371 Sparta are estimated to be 40-60,000 and 140-200,000 respectively in a total population of 190-270,000 (V. Ehrenberg: *The Greek State*, Methuen, 1969, pp 31-32).

Thus the state which emerged in post-1917 Russia and the few who controlled it, not only appropriated all power, resources and wealth to itself but Russian society also was 'absorbed, processed and assimilated by the state'. (*Moscow News*, 21, 1990). According to L.Karpensky, "The meaning of statization consists in the concealed transformation of public property as personified by the state into the private property of the nomenclature, the state's administrative power". In such a context it was natural that Lenin directed the appropriation of all sources and wealth and even a calamity like the Russian famine of the 1920's in which more than 30 million people are officially said to have suffered, became an opportunity and excuse to seize the wealth

of the Russian orthodox christian church. In March 1922 he sent a message to Molotov which said, "For you, this moment not only is exceptionally favourable but in fact the only moment when we have 99 chances in 100 of utterly defeating the enemy and securing for ourselves the policy we need for many decades ahead. Today there are instances of cannibalism in famine stricken areas and the roads are littered with hundreds if not thousands of corpses. We can (and therefore must) seize church valuables with mad and merciless energy never yielding to any resistance". (*Moscow News*, 32, 1990). From this Russian illustration Indians can well visualize the events leading to the Bengal famine of 1769 and its aftermath, in which 1/3 of the people perished, and what happened during later Indian famines till 1943-44.

Yet, strangely, in the same way as the people of Russia have somehow survived this 70 year long holocaust, the Russian church seems to have retained the Russian people's trust. According to a recent survey, the conclusion of which is said to be applicable to the whole of the USSR, 17.5% of the Russian people have complete trust in the church, 46.8% have trust in it, 24.1% do not trust it very much, and 4.8% do not trust it at all. The corresponding proportion for the Government and CPSU are 4.0%, 24.3%, 42.1%, 22.5%, and 5.4%, 33.4%, 37.0% and 17.3% respectively. The trust enjoyed by the armed forces is more than that enjoyed by the Government or the CPSU, but less than that enjoyed by the church and it is 12.3%, 44.1%, 33.9% and 8.0%.

It is possible that the above writings and reflections on life and society in the USSR since about 1909, and more so as it existed since 1917, are not the only and even the dominant views which are being debated in the USSR today.

A great debate however has been going on in the USSR since about 1955, and though it has had its ups and downs, on the whole it has become more and more vibrant and has so influenced general opinion that ideas and institutions which had been wiped out from the language of the Russian people have come back, perhaps with greater vigour than these had immediately before 1917. It is possible that what are known as market forces will be determining the future of the USSR for decades to come. But it is conceivable and more probable that the primary factors in the reshaping of the USSR would be its own long past, the forging of the broken links with this past a major aim, without, at the same time, any abandonment of the acquisitions, knowledge, technologies the USSR acquired during the past 70 years. Nations and people do not easily give up their acquisitions. What they usually do is to find new and less visible and controversial ways and devices to hold what they consider their heritage (however illgotten) and to build upon it and expand it if possible. The search

in the USSR appears to be more for "ethics and compassion" without which "a civilised market and a civilised society" are considered unthinkable (*Soviet Literature*, No.5, 1990, p. 134). According to a Russian literary critic, "it is we who blithely strayed to the edge of the precipice and we who now are trying to crawl trembling away as can be seen from our publications on philosophy, prose, our poetry at its best and most spiritual, and from today's new literature scouting its way forward into the world of Christianity".

"We are not yet wholly ready to receive this unexpected wealth because we have almost forgotten the words it uses. Estranged from language which was natural for our own forefathers, we wince at words like Faith, the Devil, Orthodoxy, and God (who can now again be printed with a capital letter). We still haven't got out of the habit of trying to substitute something 'More readily comprehensible': the Ideal, Spirituality, Tradition. The realisation is already dawning, however, that these are not synonyms and that we are going to have to recall our native language in all its fullness. Russia's thought was fully formed and systematised by the 1920's but was forced into emigration, exiled, imprisoned, and buried in 'Special Depositories' before it had time to be heard in all its glory throughout Russia. Now, as if too long deprived of its rightful reader, it suddenly cascades upon him from all directions at once and he drinks it down with grateful and perfect attentiveness, every line of it as alive and topical as the day it was written. Our only problem now is to find the time to mark the margins, gasping in amazement as we impatiently copy out excerpts, to rejoice in thought which is so completely up to the minute; and to weep that it could not all have been heard long ago. We glory in the penetrating insights and only hope that now at last, when we have paid so dearly, we shall get to hear and understand every last work and that we shall be able to reconcile it all". And further, "The task of man, of our people, and of mankind is not to dream ineffectually of absolute perfection; no more is it to devote ourselves to the petty-minded and unworthy service of merely mortal ends. It is to bring that which is below into harmony with that which is above. It is to strive actively for the perfection of every aspect of our personal and collective life so that God's will should be done on Earth as it is in Heaven". (*Soviet Literature*, No.5, 1990, p.150-151).

As we the Indian elite, even those who daily perform long poojas to the Hindu, Muslim or Christian God, seem to have lost the ability to link the various constituents which go into the making of human life and society, such a Russian analysis may not today be comprehensible to us. Yet if we do not make even an attempt at such understanding the loss in everyway would only be ours. We already are oblivious of

what is happening in other parts of the world, and why various people areas, and societies operate the way they do, and what really makes them tick.

A calm consideration of what has been happening in the USSR and in Eastern Europe should lead us to reflect about our own situation, to the derailment during 1946-1950 of our aspirations for rejuvenated India and the hijacking of the Indian state by the alienated westernizers. Its scale, perhaps, was not as vast as of what happened in the USSR, but possibly it has had much more deadly effect on our people, the society and heritage on which it was founded, and on the rejection of their skills and creative capacities. Furthermore, it should take us back to our own 1909 when Mohandas Karamchand Gandhi gave utterance to his thoughts and reflections, founded on what he considered as the perennial philosophy and outlook of India in the long dialogue which he termed *Hind Swaraj*. Despite the different civilizational origins and differing historical experiences and physiological outlooks, we may yet find that in many essential matters there is much in common between the insights and premonitions of Gandhiji and the Russian philosophers like Berdyayev, and writers like Zamyatin and Platonov, and many others who have reflected on the condition of man in modern or ancient times. Even if some of us have reservations about some of Gandhiji's ideas and actions-such reservations have been around in the air for over 70-years, - it would be admitted that irrespective of all his errors and failures Mahatma Gandhi enabled us and our society to become more courageous, to regain some sense of dignity and that he tried to show us a vision of what we consider as precious in our civilization. Illustrations of the transformation he enabled to bring about are countless.

Much like the people of the USSR and perhaps like most in the modern world we have also to arise from under the rubble. The only difference may be that if not in actual reality, yet at the level of feeling, thinking and believing except for brief periods, like the countrywide attempt at indigenous resurgence by localities, regions, and political communities against an intolerable despotism of Delhi and its Subedars from about 1680-1750, or the sense of freedom and dignity generated during the days of Gandhiji during 1916-1948, we may consider ourselves to be buried under such rubble for much longer. But that one can arise from under this rubble is well demonstrated, if not so convincingly by the changes which have come in the world during the past 40-50 years, then at least quite conclusively by what has recently been happening at unimaginable speed in Eastern Europe and the USSR.

Dharampal
T 18/2 Arundale Beach Road
Besant Nagar, Madras 600090

SWADESHNITI

Politics deprives man of his activity. It appears paradoxical to say so because commonly it is observed that politics becomes possible only when men become active. However, it is an illusion. Political activity is in fact not human, it is *asuri*. Politics is just a means, and that too an evil one, for man to give shape to his base desires of ruling over others and enjoying the fruits of their labour. The abstract and generalised form of politics has a value-free basis and its structure and content bear no relation with morality. It was this politics which was challenged by Gandhi during the Independence-struggle, and the expectation arose that the people of India may regain their lost activity. But ironically political independence became that very occasion which brought to an end the great non-political active stream of Indian public life so assiduously built by the Mahatma. Politics, then on, began to be all pervasive. This illusory and *asuri* form of human activity became its own rationale for existence. Public life began to 'respect' only political standards. This rule and its opposition both tended to have a common basis so illusory and a real polarisation appears to have begun. A fundamental challenge to politics has risen again. Way is being paved for new meanings of 'governance' and 'public life'.

The last decade, namely the Eighties, has witnessed great changes in politics. Radical politics in vogue in the name of communism and socialism has run its course, and there is no political party now which may even talk of revolution or radical change. Some splinter socialist and communist groups remain, but it is doubtful whether they will ever become relevant again. This vacuum in politics appears quite persistent with no signs of it being filled. Also it does not merely appear to be a crisis or decadence of this or that 'ism', but perhaps characterises the radical inadequacy of that political philosophy of the West which gave birth to principles of 'democracy' and 'socialism'. This political philosophy is not able anymore to give shape to any idea of radical politics. Now the clashes between the government and opposition do not take the shape of political polarisation, they only activate the diplomatic ring. All this seems to indicate that politics in India is facing a very serious crisis. The very relationship between politics, governance and wellbeing of the people seems to be perverted. So those interested in the wellbeing of the people, and in public life in general have no alternative but to examine afresh issues related to politics. Such examination is expected

to be all the more rewarding if attempt is made to keep clear of the Enlightenment theory.

Politics and Human Activity

A man can be said to be active when he is the master of both his activity and the fruits of his activity. From the very beginning man has been a social being. Processes of change in his relations with other men and with nature constitute his life-process. It is in the context of these relations that he enters into a relation with himself and develops a self-image. So active men are those who find themselves in a position to influence the constant change in these relations, develop new conceptions accordingly and give them the desired shape. Societies in which this happens are active societies.

Active men, who shape their own life-processes, are the ones who develop the guiding principles and ideals of those processes. They are the creators of philosophy, art, science, religion etc. They are the progenitors of politics and *swadeshniti*. History of man, therefore, is the history of human activity, the great variety of forms it takes, the peaks and troughs through which it passes.

But of cardinal importance is the fact that this activity of man is of two types: one, *asuri* and the other, human. *Asuri* activity is amoral, it is value-neutral. Philosophies, arts and sciences which are products of such activity are amoral too. It is not that men of *asuri* activity have got nothing to do with morality, also not that there is no place for morality in their lives, but just that in the foundations of their activity morality has no place. Such people do not hesitate in exploiting others and devastating nature, in the course of organising their own lives and goals. They have no standards in their life which may stop them from such activity because their science, arts and philosophies, are amoral, without a moral consequence. Modern society of the West is such a society where for over five hundred years now the philosophies, arts and the sciences have been in the process of getting rid of the value dimension. And during this period, exploitation of other societies and civilisations by the West has constantly been on the increase. *Politics is the concentrated expression of this asuri activity*. Alongwith it is also the most important means of the development and spread of this activity. In India, *asuri* activity made its appearance through politics and till date politics remains the most important vehicle of its spread.

Human activity has its basis in morality. Man, who is the master of such activity sets only such aims for himself which can be achieved without destroying nature and

without taking recourse to unjust methods and exploitation. Societies pervaded with such activity are based on cooperation and mutual understanding. Such societies give birth to philosophies which are sources of strength and inspiration for men and which develop conceptual foundations for moral rigor in society. These philosophies, other than being an inspiration for human action, bring those standards into existence which control and limit the *asuri* tendency in men.

Human activity is the source of sciences which are not neutral towards moral questions. Such sciences do not provide the basis or means of exploitation of man or nature. These sciences produce such an understanding of man's activity and nature's behavior that is possible to fulfil everyone's just needs. (It is only a value-neutral science which provides the where withal to fulfil greed and oppressive demands). Such activity is not limited to only a few in society but has a great spread. And this spread too acts as a constraint on *asuri* tendencies, other than being the medium of a great variety of cultural expressions and value-intensive art. This activity of man has the other name of truth. It is this activity that gives birth to ever new forms of truth.

Swadeshniti is the chief instrument which gives concrete shape to this human activity while in turn deriving its own genesis from it. So, *Swadeshniti* is related to human activity in the same way as politics is to *asuri* activity.

***Swadeshniti* : Concept and Reality**

The Eighties have witnessed a new challenge to politics in India. This process has been given a robust beginning by the peasant movement. A movement which was already in existence in Tamilnadu and Punjab assumed a nationwide spread when peasants of Maharashtra and Karnataka took to the path of struggle in 1979. Since then Uttar Pradesh and Gujarat have seen major peasant uprisings. All these peasant organisations, barring perhaps Maharashtra, called themselves non-political. In fact the whole movement calls itself non-political. But the meaning of non-political is not clear because different organisations have tended to do different things under such a banner. For example the organizations of Tamilnadu and Karnataka have eventually ended up building political parties and different state organisations have adopted different approaches on the questions of relation with political parties and participation in elections. The leadership also doesn't very often distinguish between non-party and non-political. But what is important to note is that this concept of non-political has been a pronounced and effectively used concept in almost all the states in the initial phases of organisation

and mobilisation. It has been extensively debated in the movement, and has even been the cause of dissensions and splits.

My contention is that appearance of this concept of non-political in the public arena has set the stage for the rise of a new philosophy, ideology. Although it is true that after a non-political beginning a number of peasant organisations turned political in a few years time, new organisations kept coming into existence which kept this concept alive. Now even if all peasant organisations turn political the idea of non-political can no more be withdrawn. A new ideology has been born. It is the starting point for building a *swadeshi* philosophy in this area of human endeavour. This concept of non-political is based on total opposition to politics and has in it a message of a new view point for organisation and change of society.

The philosophy related to this subject discusses two types of societies : one, political society and the other, non-political society. Political society is one in which there is a central authority which makes codes of conduct in society and which is also responsible for enforcing them. This authority has the sanction for use of force in well-defined cases for such enforcement. Societies which do not have a such a central authority are called non-political societies. Societies of the Western world today are definitely political societies. Perhaps with equal certainty we can say that ancient Indian society was a non-political society. The pre-modern society also appears to be non-political in the above sense. In the history of this land one sees time and again rise of central powers, but none of them seems to have developed into a law and order state; on the contrary their powers in both the areas of revenue and law and order were negligible compared to such powers enjoyed by any modern state. Those societies ordinarily had a number of self-governing local formations which could not have given any central authority the privilege to make the rules of conduct for everybody, leave alone the sanction to enforce any such rules by the use of force.

Through its concept of the non-political, the peasant movement expresses its preference for this second type of society and at the same time represents, within the Indian society, the non-political society and the elements favorable for its governance as such. In other words this non-politicality is not only the peasant's wish but it is also an expression of his mental and material self. It is this representative and expressive character put together which make this concept real and therefore the emergence of a new *swadeshi* ideology a real possibility.

This principle of non-politicality born in the wake of the peasant movement is a particular expression of *swadeshniti*. *Swadeshniti* may be said to provide the principle of organisation and governance of non-political societies. It is an integral part of the *swadeshi* philosophy which is the ideology of liberation of the people who are victims of Western imperialism. It is a mode of realising the robbed activity of these people. Principles of democracy and socialism are political principles of political societies, whereas *swaraj* as explained by Gandhi is an idea applicable to non-political societies. *Swadeshniti* of the peasant movement is in continuity with Gandhi.

The peasant movement has popularised the Bharat-India terminology. The expression is due to Sharad Joshi according to whom it is expressive of the basic economic condition, in the sense that Bharat is the supplier of raw-materials to India. But those who are receiving these ideas do not limit their significance only to economics. The idea that this nation is fundamentally divided into two parts is fairly popular now. This division into *paschimikrt* and *swadeshi samaj* has bearing in every field, economic, political, social, cultural, philosophical, etc. *Paschimikrt samaj* consists of classes which have come into existence after the advent of the British.

Swadeshi samaj includes classes and people who were already there when the British came and who have, by their life and industry, paid the price of development of the last two hundred years. Peasants are the chief component of this *swadeshi samaj* and peasant movement is the vanguard activity of the movement for liberation of this *swadeshi samaj*. It is in this sense that peasant movement is in continuity with the movement led by Gandhiji. This *swadeshi samaj* is a non-political society and *swadeshniti* is the name of its principle of governance and change in society.

In the ideology of the *swadeshi samaj* there is no place for centralised political power. Therefore no such power can derive sustenance from the active support of the *swadeshi samaj*, nor does it consider the laws and regulations made by such powers worthy of being obeyed or conformed to. So the use of force too, for enforcement of laws accepted and respected, by the *Paschimikrt samaj*, is not considered justiceable by the *swadeshi samaj*. It stands in radical opposition to such force, not just because it has been used to splinter it and make it political but also because such force has no place in its way of thinking. That is, this force which is in the basis of politics has no place in *swadeshniti* which conceives of force in moral terms, say in the form of *satyagraha*, and this *satyagraha* often takes the form of non-cooperation in the struggle against politics.

The movement in Uttar Pradesh, under the leadership of Choudhary Mahendra Singh Tikait, has drawn attention towards certain aspects of *Swadeshniti*. But before we discuss them, a brief look at the historical context may prove useful.

Historical Context

In this country the political society was established by the British. When they came to India, there was no central political power of this kind here. Indian society, then was organised primarily based on the self-governing establishments of village, sect and caste etc. Exploitation and hierarchy were not central to the caste organisation and most of the revenue was both collected and disbursed at the local level. Children of all castes received formal education on a wide scale. Girls too were educated. People generally ate and lived better than in England and there was less disparity. Kings came from all castes who spent relatively austere lives and mixed with the general people quite freely. When there occurred conflict between the scriptural authority and popular custom, it was the custom which was given priority. This was the *swadeshi samaj* which was so thoroughly disoriented and disorganised by the British. It is not that *swadeshniti* was completely free from fraud, but only that it was not founded on falsehood and dishonesty. This is the reason why *swadeshi samaj* could never comprehend that politics imported by the British, whose foundations were in falsehood, fraud and dishonesty. So in the clash between *swadeshniti* and politics, the latter won again and again, ultimately scoring its final victory over the traditional *swadeshniti* in the War of 1857, as a result of which *swadeshi samaj* lost its organised identity.

After 1857, the modern state was formally established in India : new laws were made, a new penal code and codes of behavior came into existence. The development of the British industry, means of transport, system of education and justice, police, army, bureaucracy and government services gave birth to new classes which bore allegiance to the new state. This is the *paschmikrit samaj* with whom the political society began to take shape. Since then all politics has been the politics of the *paschimikrit samaj*. Nationalism, democracy, socialism, communism are the covers under which this politics has grown. From the very beginning till today *swadeshi samaj* has been the victim of this politics.

Disarmed and defenceless *swadeshi samaj* was turned into an amorphous mass. It is not that it did not try to stand up in the decades following 1860, but such events are not recorded in history, for all history is the history of politics. *Swadeshniti* could not have any public expression because all that was public was under the dictates of

the political society. In fact this process privatized the human activity of the *swadeshi samaj*. Its science, technique, dharma, architecture, values, standards, philosophy, nothing had a place in the public realm. It could start growing out of this situation with the emergence of Gandhi.

Gandhi gave this *swadeshi samaj* an identity. He led it on to the path of struggle for it to regain its lost activity and a respectable place in society. According to the change in times Gandhi gave shape to a new *swadeshniti* and presented it as an alternative to politics. The concepts of truth, non-violence, love, swaraj, and satyagraha do not belong to the realm of politics, nor do they cater to the needs of political society. Gandhi erected a movement informed by such concepts which led to organised identity of the non-political society and paved the way for its liberation. After the establishment of political society in the country this was the first attempt to give a public shape and place to *swadeshniti*.

Political independence opened new avenues of progress for the *paschimikrt samaj*. But the main hurdles in this progress after the Western model were the unity of the *Swadeshi samaj*, its organised identity and its leadership based on *Swadeshniti*. These were removed systematically after Independence. Just as before, now too, the emotions, feelings, sensitivity and consciousness of the *Swadeshi samaj* had no place in politics. The government of Independent India and the Opposition of all kinds, both derived their inspiration from Western history and support from the Western theories in the democratic game they started to play. Now Truth, non-violence, swaraj, satyagraha, and panchayat etc. once again had no place in public life and concepts like democracy, class-struggle, socialism and secularism started to dominate the means of expression.

Even the well-wishers of *swadeshi samaj* could not see the fundamental division between politics and *swadeshniti*, and kept themselves busy in trying to find in and through politics only the path of emancipation of the *swadeshi samaj*. Men like Dr. Ram Manohar Lohia, a supporter of peasant revolution and Choudhary Charan Singh, the representative of peasantry in the government, opposed the industrial policy revolution of 1956 and gave political shape to anti-congressism in 1967. In the leadership of Sri Jayaprakash Narayan, the Bihar movement of 1974 did bring forth the idea of partylessness but it could not recognise the fundamental category of non-politicality. It was as a result of these challenges that the Congress finally fell from the citadel of power in Delhi in 1977. But whereas these events can be seen as preliminary steps of the *swadeshi samaj* towards regaining its lost unity and identity, at the same time, the events of 1977-79,

viz. the Janata rule from Delhi made it clear that it is impossible to protect the interests of the *swadeshi samaj* through politics.

This is the historical context of the non-politicality of the peasant movement and the present context of the development of *swadeshniti*. Through this new principle of society the peasant movement has put forward its message for the possible path of emancipation of the *swadeshi samaj*. This *swadeshi samaj* is not a figment of anybody's imagination, it is a society of those people who are today engaged in a life and death struggle and whose organised identity can be seen as being in continuity with the pre-British times. These are peasants, tribals and women, inhabitants of economically backward areas and people of towns like Varanasi. All these may exhibit a wish and a tendency to lead a modern life, for anyway the spontaneous aspirations of the people are generally guided by the dominant classes in any society, but in their modes of thought there is no place for a force (and violence) - based central political authority. On the contrary they often derive inspiration and direction from local faculties based on *swadharma* and maintain moral standards in most aspects of their life-processes. *Swadeshniti* is the name of the system which makes it possible for this *swadeshi samaj* to live well and in its own way and which has the capacity for constant struggle against politics.

The struggle between *swadeshniti* and politics is entering a new stage today. This phase may even be decisive. It is no mean struggle. On one side are truth, love, ahimsa, etc. Whereas the other side is dominated by untruth, hatred and violence. This is *devasura sangram* of today. This is the contemporary Mahabharat.

Panchayat

God knows for how long the people of this country had been actualising their activity through the panchayat, which was at the centre of the social and governmental organization. Important social and economic activities like distribution of justice etc. were performed by the panchayats. These panchayats were the units of local self-government which functioned on consensus and commanded the right of decision-making on almost all important aspects of human life. The British destroyed this panchayat. The leaders of Independent India went further and tried to erect such a system in the name of panchayat which may even erase the memories of a great tradition. The traditional panchayat was the basis of and a concrete expression of *swadeshniti*. But infatuation with it is of no use, it cannot be recreated any more. When that society has been totally destroyed how can only a part of it be recreated? It is not possible.

However, the memories of traditional panchayat may be useful in developing the concept of *swadeshniti* today. The identification of its spiritual and material lifeline may render valuable help in developing a new concept of panchayat which is in tune with the times.

Social organisation of traditional India was based on the units of village, caste and sect. There were panchayats of village, caste and sect. These three social organisations are related to three fundamental departments of human life. These are the places of dwelling, occupation and thought. Those who lived in a place constituted the village, those engaged in similar occupations made up caste and those who thought similarly belonged to a sect. So organisations of those who live together, those who do the same work and those who share a belief system are the basic social and governmental organisations of *swaraj*. This is also the starting point to think about the possible panchayat of today.

As it has already been said, the Indian society today is fundamentally divided into *paschimikrt* and *swadeshi samaj*. The *paschimikrt samaj* is political and is made up of classes brought into being by the British. It has no experience of the panchayat system. Classes constituting it have given birth to political organisations. Union and party are the proto-types of such organisations. Capitalist, bureaucrat, lawyer, doctor, teacher, government employee, industrial worker all have their unions which promote and protect the sectional interests of the respective groupings, through collective bargain and political intervention. The leadership of all the political parties belongs to these classes. These are the classes which support central political authority and render justiceable the use of force by it. The unions are in fact organisations of those whose work is similar, so they are overtime transformable into such panchayats if a panchayat system is implemented in the leadership of the *swadeshi samaj*.

Swadeshi samaj is non-political. It has a long experience of the panchayat. In remote places one may still find some remnants of the old panchayat among tribals and peasants. It is this *swadeshi samaj* which has to give shape to the new panchayat. Today its movement, the peasant movement, is wavering between the panchayat and the union. It will have to give up the union. Union is a non-moral, value-independent organisation, it cannot prepare the grounds for realisation of human activity. It is the panchayat which needs to be given a contemporary meaning. Let us, therefore, discuss briefly in today's context the meaning of panchayat of those who live together, of those who share a belief system and also, perhaps, ritual.

The traditional Indian village has been destroyed. What we hear from our great grand fathers does not create the image of the traditional village, but of a village whose economic and *swadeshniti* basis has already been broken. Our great grandfathers tell us the story of that village which is labouring to stay alive a hundred years after the *panchayat* system was destroyed, whose industrial, agricultural, economic and financial arrangements were broken as long ago. If we take such village to be the traditional Indian village, we shall fail to work out effective ideas for regeneration and reconstruction. Today village is not the primary unit of people who know each other closely and are related among themselves through social and economic interaction. To present the village as such a unit today is in the interest of politics and central political authority. No *swadeshnatic* organisation can be built on the unreal basis of today's village - so also the village is no more that spatial unit on which panchayat could be erected. So the search in this area ought to be of such spatial configuration which could provide the effective basis for a panchayat. This could be on an average an area with about ten thousand inhabitants, it could be the command area of a rural market or this expanse may include areas from which people join in a social function like a marriage etc. Obviously none of this singly could give the real basis but these and similar considerations may be of the type which must go into the identification of the critical spatial unit. Also because of the size and diversity of the nation, this critical spatial unit is likely to differ considerably in size and other matters in different parts. However we may try to identify some basic elements of the criteria to be deployed for the identification of such a unit.

Place-bound panchayat should include people who come to know one another in course of their daily activity and are related with one another through similar interests and economic and social interaction. In the basis of such a panchayat the moral aspect shall have a firm place. Today we must find the largest possible area which fulfils these conditions. If a smaller area is taken, for example, the present village, then this form of *swadeshniti* (panchayat) shall not be able to stand up against politics and if the area is too large, which can happen if the district is so selected, then its activities shall fail to have a moral reference, they will not embody the values of the people and the panchayat shall cease to be an instance of *swadeshniti*, it will become political. In the end we only note this that to erect such panchayats is the task of a movement of the *swadeshi samaj* and the time available is not unlimited.

Although people of the *swadeshi samaj* are engaged in all kinds of occupations now, in the main three occupations can be identified to which the bulk belongs. These are agriculture, forest and domestic work. The three main constituents of the *swadeshi samaj*

are related with these three types of work. These are peasants, tribals and women. This is also the context in which we can discuss the panchayat based on occupation.

Modernisation of technique, market, means of transport and financial resources has radically altered the nature of agriculture. The desire to re-establish old forms of agriculture is reactionary and the wish to see in agriculture the only basis of life is utopian. As it is such reactionary and utopian thoughts are prevalent only among those whose means of livelihood are not dependent on agriculture. The peasant movement of today has expressed no such inclinations, its object is to regain a respectful place for the peasant in the realities of today. This is why loans, electricity rates and prices have emerged as the chief questions. The campaigns against corruption do underline the moral silverline. These questions are not permanent, they are the results of the present arrangement of things and may change with the times. But these questions tell us something about the central concerns of the peasant life today. One way to solve these problems is to build unions and intervene politically. These methods may yield some immediate results, although that too is doubtful, but the way to permanent or longstanding solutions of these problems is the way of the peasant panchayat which is based on an equitable combination of the economic and moral facets of life. This panchayat ought to be conceived of as the chief governing body of all that relates to agriculture; solution of problems is only a small part of this.

A large part of the population of the country is made up of tribals who are still far away from politics and cities. In the last two hundred years they have fought several great battles against external intervention in their mode of life. But slowly they have lost all control over the forests, the chief sources of their livelihood. Large scale deforestation has devastated their inhabitants. Broadly speaking only two ways are open for them now. The first is to continue in the process of gradual civilization in the wake of the constant spread of politics in accordance with the needs of the *paschimikrt samaj* and as a result be transformed into a totally baseless manual labour or be exterminated. The second involves rise of movements which are in search of new forms of governance of their lives. From this point of view the demand for a separate Jharkhand state is a right demand. They alone can determine the new forms of their panchayat. This is so especially because their ways of thinking and living, dharma, philosophy, everything is totally different. Most public activists do not realise the seriousness of this and labour under the air of showing them the path. This is the political outlook. *Swadeshniti* sees them as free and capable of determining their styles of life and of inventing new social forms to give shape to their activity. Others cannot do it anyway.

The third major constituent of the *swadeshi samaj* is the woman. She is everywhere, her interests are tied with those of the peasants and tribals and because of their main role in domestic affairs women in general have common sets of interests as a social segment. With the development of political societies ever new forms of her exploitation have come into being. It is because of this that women's movement is a reality now. This movement too can give shape to such organisations which are like unions and work through political intervention. It has also happened. But the experience in the Western world shows that participation in public affairs of the political society does not lead to women's emancipation; on the contrary new forms of exploitation are born. The way to emancipation does not lie in changing the content of her work but in changing society such that her work assumes public status. This is the path of her liberation from the suppression and alienation she suffers in domestic life too today. The basis of women's panchayat should be in their present work. Modern society has turned reproduction of life, upbringing of children and domestic work in general into a totally private affair. The chief task of the women's panchayat shall be to lift it to a public status. In this process the very concept of 'public' will have to be changed, its value-neutral form will have to be changed. It is an epoch making exercise and women are more than capable of doing this.

One of the major defects of the political society is that in such a society different points of view have no scope for development. The realm of thought constitutes an important aspect of human activity, a major stream in man's life in general. But for today's central authority no thoughts have any value. The development of science has brought into existence a concept of objective knowledge before which all forms of human thinking fade into irrelevance. Even dharma, perhaps the most widespread way of thinking in our society, is attempted to be converted into a private entity by the political society. To privatise an ideology means destroying the motive force in it. In such a situation groups and collectivities which are based on common system of belief assume special significance. The panchayats of such sects are those forms of human organisation which keep open the great variety of dimensions along which human thought progresses. So it is a very important task of *swadeshniti* to bring into existence panchayats of various sects or social streams based on thought and give such *panchayats* their proper place in public life. Not that such organisations are not in existence today. Hindus, sikhs, Muslims, Christians, followers of Kabir, Ramkrishna and Gandhi and people of many other sects are organised based on their common sets of beliefs and rituals. But politics is constantly attempting to limit them, tame them and often even destroy them. Politics is afraid of the powerful public status of such organisations, so the dominant theories of the political society propound the principle of privatisation

of religion. But *swadeshniti* works for the progress of such *panchayats*, it respects them, and assigns them their due place among those social forms and institutions which are the means of realisation and concrete expression of human activity.

To Sum Up

In this article an attempt has been made to draw a concise picture of the embryo of a new ideology of social emancipation. This is the non-political ideology taking shape in the robust context of the present peasant movement. Named *swadeshniti*, its basis and sustenance are identified in human (as opposed to *asuri*) activity. The movement of the non-political society existing today in the form of *swadeshi samaj* alone can give shape to those units (*panchayats*) of self-governance which are capable of waging struggle against politics. The war of 1857 was the last struggle between traditional *swadeshniti* and politics, in which the latter emerged victorious. Gandhi developed the *swadeshniti* of the modern times and placed it in struggle against politics. The peasant movement is the next stage of this struggle. So we have entered now a new period characterised by the challenge to politics which is based on further development of *swadeshniti*.

Sunil Sahasrabudhey
Gandhian Institute of Studies
Varanasi

Research as Strategy: Interview with M. S. Swaminathan

Dr.M.S. Swaminathan (b.1925) is too wellknown to need a detailed introduction. After education and training at Coimbatore, Delhi Wageningen (Holland), Cambridge (U.K.) and Wisconsin (U.S.A.), Dr. Swaminathan joined the Indian Agricultural Research Institute in 1954, becoming its Director in 1966. He became Director-General of the Indian Council of Agricultural Research in 1972 and was made the Principal Secretary, Ministry of Agriculture in 1979. He was subsequently (1980-82) Acting Deputy Chairman and Member, Planning Commission, in charge of S & T, agriculture, rural development, environment and health. He was at the International Rice Research Institute during 1982-88 and is currently the Chairman of M.S. Swaminathan Research Foundation at Madras. During the last 40 years, Dr.Swaminathan has published over 200 scientific papers and has guided about 60 students towards their post-graduate and doctoral degrees. He is associated with a number of scientific and professional bodies. He is a Fellow of the Indian Academy of Sciences and of the Indian National Science Academy and was General President of the Indian Science Congress (1976). He is also a member or fellow of scientific and literary academies in other countries, such as China, Britain, USSR, and the USA. He has been associated with many international bodies; he was Chairman of the Council of the Food and Agriculture Organisation (FAO - 1981-85) and is the current President of the International Union for Conservation of Nature. He has won several awards and prizes and received the Padma Vibhushan in 1989.

How do you see the continuity between your science and your own role as an organiser of research, education and extension in agriculture, which tended to have impact on the lifestyles of a large population?

When I joined the agriculture college at Coimbatore in 1944, World War II was in progress and the Bengal famine of 1942-43 had taken a toll of over 2 million lives. One could then see the importance of agriculture to a country like ours. There was a serious shortage of food and other agricultural produce. In the college, it was clear that the improvements in agricultural productivity and yield could be brought about through the science of genetics. Already in Coimbatore, a good amount of work had been done by way of breeding for crop improvement. The work of the late Sir

T.S.Venkataraman in sugarcane breeding was wellknown. The work of the late Dr.K.Ramaiah in the area of rice was also wellknown. So was breeding research in the area of millets and fodders and so on. The quality of such work was so outstanding, it made a deep impression on me and I also thought that genetics should be applied to gain yield improvement in crops, greater disease resistance and so on. After completing my B.Sc.Ag. degree at Coimbatore, I joined the Indian Agricultural Research Institute in Delhi in 1947, to continue my education. During my stay there in 1947-1949 I had worked with the late Dr.Harbhajan Singh and the late Dr.B.P.Pal on non-tuber-bearing *Solanum* species (i.e. brinjal). In 1949, I left for Holland on a UNESCO Fellowship to work at the agricultural university at Wageningen. In Holland then, crop rotations could not be practised because it was just after the war. At the time, potato cultivation under no rotation conditions was often the target of diseases caused by nematodes and so my interest was directed to transfer of disease resistance from the wild species of potato to those in cultivation.

This work I found quite promising and I moved to Cambridge after a year to do my Ph.D degree in Genetics. Based on my work in Cambridge, I got an offer from the Department of Genetics, University of Wisconsin to participate in setting up the Inter-regional Potato Introduction Station in Wisconsin, USA, which was being organised as a collection of genetic resources of potato from all over Latin America. I was offered a permanent position in the Univ. of Wisconsin but I decided to return to India in 1953.

After my return, early in 1954, I joined my teacher Dr.N.Parthasarathy who was Director of the Central Rice Research Institute, Cuttack, on a temporary assignment. My work was to do with the "Indo-Japonica" hybridisation of rice. Subsequently I moved to IARI, Delhi as Assistant Cytogeneticist, eventually becoming its Director in 1966.

The philosophy of the rice-hybridisation programme as conceived by Ramaiah and Parthasarathy was as follows: The Indian rice varieties were not capable of using much nitrogen, because they had not been grown under conditions of high availability of nitrogen. So their yield potential was limited to 1-2 tonnes per hectare. On the other hand, the Japonica varieties had been selected for response to increased availability of nitrogen. The aim of the programme was to get this feature incorporated in Indica varieties keeping intact their own characteristics of grain quality, adaptation to our growing conditions, photo-sensitivity and so on. It is during work on this project that it occurred to me that response to soil fertility and water management in other crops also needed to be genetically improved. When I moved to IARI in late 1954, I shifted

to research in wheat on the advice of Dr. Pal who was then the Director of IARI. I then initiated research designed to develop wheat varieties which can respond well to good soil fertility and water management.

Between 1956-59, over 18,000 trials had been carried out all over India on Indian wheat and rice varieties under a simple fertiliser trial programme. The results indicated that our varieties could not give economic response to over 20 kgs of nitrogen per hectare since they fell down or "lodged" at higher nitrogen levels. At that time, our yields were about one tonne of wheat or rice per hectare. Increase of yield further on the basis of native soil fertility alone was not possible as the native soil fertility could sustain a yield of only about one tonne per hectare. For achieving higher yields, the application of mineral fertilizers became a must. I had always believed that a combination of different approaches is the best way of attacking a problem and in my research on wheat varieties, I tried inter-specific crossing (between different wheat (*Triticum*) species), radiation genetics and so on. In this connection, I came across in 1960 the results of a semi-dwarf winter wheat variety at the laboratory of Dr. O. Vogel of Washington State, USA which gave yields of 12-15 tonnes. On inquiry, Vogel directed me to Dr. Borlaug who was operating a wheat programme in Mexico and was developing semi-dwarf varieties in a spring wheat background. Borlaug had essentially used the "Norin" dwarfing genes which had been obtained from Japan by Dr. Soloman who had been a scientific advisor with the Occupation Administration (1945-53). When I contacted Dr. Borlaug in 1962, he wanted an invitation from the Govt. of India, which Dr. Pal was able to arrange. He visited India in March 1963 and sent a wide range of dwarf wheat material in September 1963.

Here, I may clear a certain misconception that is common. Many foreign scholars often write that the genetic improvement of wheat by dwarfs was their idea which we took. On the contrary we had our own, independent programme and the supply of semi-dwarf material by Dr. N.E. Borlaug in 1963 was specifically at our request. The idea that we must breed wheat and rice varieties capable of responding well to good soil fertility and water management was entirely ours. All that we sought from outside was suitable genetic material for breeding fertiliser-responsive varieties.

The dwarf variety was important to us for many reasons: one was that it had a different morphological architecture and physiological rhythm, so that more weight, more nutrients were stored in grains than in other parts of biomass. Thus, increase in nutrient availability and grain yield could be linked. Secondly, they were responsive to irrigation. For example, the traditional wheat varieties which needed water in the

early spring, would flatten on application of water, whereas the dwarf varieties would not. There were many dwarfs, we had one in India, the "Mohenjodaro dwarfs" (*Triticum sphaerococcum*) which had been identified during the excavations, but the dwarfing due to Norin genes gave the needed combination of characteristics. We obtained large quantities of seeds of two Mexican dwarf varieties - Lerma Roja 64-A and Sonora-64 and conducted multi-location tests in the country, which gave us the confidence that they were already suited to our conditions.

In the year 1964, Shri C. Subramaniam became the Minister of Agriculture. That was a time when our imports through the PL480 programme of USA were going up year after year. Subramaniam got in direct touch with the scientists and asked them about the strategies. I had told him about the high yielding wheat varieties from Mexico and their suitability for Indian conditions, and requested him for an opportunity to be given to scientists to demonstrate the new varieties to farmers. I pointed out that for farmers "seeing is believing"; further, results of high yields in experiments may have been due to special conditions prevailing in the test plots. The reproducibility is thus open to demonstration. In all these senses, the demonstration in farmers' fields was an important aspect of extension. Subramaniam considered this proposal and approved it, in spite of the skepticism of some of his officers. We put out 150 demonstrations in 1964-65 and they were successful. As a result, all over North India there arose considerable demand for seeds of high yielding wheat varieties. The Government of India in 1966 bought 18000 tonnes of seeds of these two varieties for distribution. This resulted in a sharp increase in the area under HYV wheat, from about 4 hectares in 1963-64 to over 4 million hectares in 1970-71. The seed multiplication was fast largely because the farmers themselves increased the quantity of seeds, looking after the plants with great care.

Following the success of this programme, the Government decided to go in for high-yield cereals. This was in 1966, when Shri Subramaniam was the Minister, and Shri B. Sivaraman was the Secretary. After Subramaniam, Shri Jagjivan Ram became the Minister, and the policy was continued under him. Thus in rice, we had the TN-1 and IR-8 varieties; in Jowar, Dr. Ganga Prasada Rao developed a hybrid variety; a hybrid of bajra was developed at Ludhiana by Dr. D.S. Athwal and several hybrids of maize were also developed under the All- India Coordinated Maize Improvement Programme. The HYV programme came in timely for the Government. Since 1961, the Intensive Agriculture District Programme (IADP) had been on going. The idea was to maximize the benefits of available water, so delta areas had been chosen for intensive agriculture. This was also called "package programme". I wrote in 1964 that the package had all

the right ingredients except the seed, the genetic material which could respond to the rest of the package.

I described these details because in my opinion the need of farming in India is to maximize the yield from the available land and water. The farmer already had problems because of his size and farming was turning uneconomical. So I thought that agricultural research had to be directed towards improvement of productivity, and diversity of cropping. In such research, I felt that the farmers must be treated as the judges, "the peers".

What criteria did you adopt in breeding programme for selection of varieties? For example, you had mentioned criteria such as photo-sensitivity etc., in describing the hybridisation of rice programme. Were you able to incorporate factors such as edibility or nutritional quality factors also?

We did incorporate nutritive factors in addition to desirable organoleptic properties. But the point is that in India there is no incentive to producing nutritionally good quality grain. In countries such as Canada, nutritive quality of grain is used in determining the price. In India, such a factor is used in milk but does not operate with grain. Hence, farmers have no particular incentive to opt for varieties which may have better nutritive properties.

The primary considerations were yield, grain quality and disease resistance. Multiple resistance to pests and diseases is very important in the cost, risk and return structure that the farmer faces. Even if a strain is nutritionally superior, it may not be preferred by the farmer because of considerations of cost, risk and return. We have not been able to make much impact on rice productivity in Eastern India, because of problems in water, pest and nutrient management.

Grain quality and consumer acceptability characteristics have also been incorporated and have been tested with the help of Home Science Colleges. But there are problems with the way the new varieties are released to farmers. In Holland, the official organization concerned releases new varieties to farmers and asks at the end of the season if he or she would like to grow it again. A "no" makes everything clear! But here the investigators concerned use formidable questionnaires and proforma and the farmer is not able to give his correct assessment about the new variety. Seed multiplication is also slow. Hence the time taken for seeds of new varieties to reach farmers is unduly long.

Talking about resistance, it is said, and we have documented local experience, that the high yield varieties in rice are more prone to pests than traditional varieties are. What is your opinion on this?

The observation is correct. I would say the problem is more with the high yield environment than with high yield varieties. The pathogens, which are also plants, tend to grow very well in the high-yield microenvironment, because of its richness, large concentrated availability of water and nutrients, and also because of the plant population density. The last is also important; for example, dwarf rice population density in the field is higher, due to yield considerations; as a result, brown plant hopper, a disease not common earlier, which multiplies at the base of the plant, has become common due to increase in density. In general, certain old problems go away, while new ones start to appear. Such shifts are known; that's why the breeder tries to incorporate a broad spectrum of resistances. The life-time of such a newly developed strain, on the average, is 5 to 6 years in the USA. By that time the pathogen builds up a new virulent strain.

This is a problem and there are a few approaches to it. There is integrated pest management. In IRRI, we started a research programme on pest management, aimed at cost reduction without yield reduction where farm grown inputs were used to replace market inputs. The concept of integrated pest management is gaining acceptance; but as yet there are difficulties in its practice in India. To be effective, all farmers in a village must participate in the process. Some sort of a get together, an organization at the village level for pest-proofing would be needed. That can create a service sector, the village youth, the children of landless labourers, could put it up and their services could be paid for. Similar things are done in China. What we need is the growth of a scientifically and socially relevant services sector in villages.

Sometime back, in a meeting consisting of experts from the universities and USDA (Bio Science, Vol.33(7), 466, 1983) it was suggested that the concept of modifying the environment to suit the needs of a laboratory developed strain may have to be reviewed in the context of the other approach, which is to select genotypes adapted to a specific environment. How would you react to this?

We must remember that bringing water to an environment changes it in a large way. In our country, we plan to bring in about 3 million hectares every year under irrigation. In this context, there is no point in talking about the existing environment because it would change. So we design ideotypes, which are conceptual models of

plants which would be necessary for a particular environment, which may be *status quo* environment, or dynamic. Changes could be in natural ecology or in human geography. For example, in Punjab, the young farmers are more comfortable using tractors rather than bullocks for ploughing. Such factors will also be necessary in selection in breeding programmes.

You had pointed out in 1972 that the rate of growth in pulse production was not keeping up with that of cereals. There is a study reported in 1985 (R.Rajagopalan in Interfaces Between Agriculture, Food Science and Nutrition (ed) K.T. Achaya, UN University Press 1985, pp. 61-85) which points out that while by 1979 we had attained food security, the overall nutritional availability had come down. What is your assessment?

In areas such as Punjab, three crops, wheat or barley, mustard and gram (chick pea) used to be grown in mixtures in a single season. This was before new wheat varieties were introduced. With the new varieties came an explosive growth of tube well irrigation. These other crops had not been used to growing in irrigated conditions. So, what resulted was a wheat monoculture of new varieties. This is how a decline in area and per capita availability of pulses began.

There were other problems, too. Firstly, high-yield varieties in pulses had not been developed; pulses which are rich in nutrients were generally cultivated under rainfed and low soil fertility conditions. Secondly, there was the problem of marketing. Since cereals, particularly rice and wheat, fetched higher prices in the market, they were preferred by the farmer over pulses whose prices were very low. As I said, in any farm, the first priority is to meet the home need, and once that is fulfilled, the rest is determined by the market. The pulses production declined on that count also.

There are views, such as those of Prof. P.V. Sukhatme, that the problem in India where cereal diet is important, is not one of protein malnutrition but undernutrition; this is so for the general population except pre-school children. But calorie malnutrition, or undernutrition can be the cause of protein malnutrition. Hence, balanced diets are essential. This is why I have been pleading for a National Nutrition Security System which will ensure every child, woman and man born in our country physical and economic access to balanced diets and safe drinking water at all times.

Why has Eastern India not experienced a green revolution? There are many irrigation projects in this area but still there is not striking yield improvement.

The irrigation system in general did not have drainage built in. Many areas, such as Kosi Command, Sarada-Sahayak Command, did not have drainage built in; further the irrigation systems were designed for kharif crop seasons. There were always floods in these months. Also, these areas are far away from sea. Water table is very high and salts have come up. All these have contributed to extensive waterlogging. The reason thus is not improper practices among farmers; the whole irrigation system did not have drainage built into it. Dr.S.R. Sen, in a report on Eastern India, had suggested that the state departments of irrigation may have to be renamed "irrinage" departments, to emphasise the importance of drainage in irrigation.

This consideration is crucial in designing irrigation systems in Eastern India, because these zones lack drainage and cause salts to come up on the top soil. Another example of a lack of a systems approach in irrigation projects is the introduction of irrigation in desert areas of Rajasthan via the Rajasthan Canal. This is a wonderful engineering accomplishment but how it is put to use is important. Water in this situation is best used to promote silvipastoral and sylvi-horticultural systems of land use combining forage grasses, legumes, fruit trees, etc., Such farming systems can also yield more income and jobs.

Since the recommendations of the Royal Commission on Agriculture in 1928, a number of research and education institutes have been set up in the country. The Imperial Council of Agricultural Research and a number of institutes were established during the period before Independence. In the 'fifties the organization of agricultural research institutes and universities in the USA seems to have exercised some influence on evolving a similar organization in this country. How do you assess this growth and change and how do you view your own work in the organization of ICAR since 1966, when you became Director of IARI and later Director General of ICAR?

When the Royal Commission on Agriculture (RCA) recommended the setting up of ICAR, it was not to run or set up institutes. There were agricultural cess funds available and, utilizing these and Government funds, the ICAR was to set up a library and information system and promote research projects. The RCA also recommended establishment of "Commodity Committees", particularly for cash crops. There were several committees, like the ones for cotton, oilseeds, coconut, jute and so on, much like the coffee and tea boards of today. These committees also had money for doing some research. In the 'fifties it was decided that the commodity research system should be reorganized into what was called the PIRCOM Centres (PIRCOM: Project for Intensification of Research in Cotton, Oilseeds and Millets). The idea was that instead of each

commodity committee doing something, the PIRCOM Centres would do research based on crop rotations, because many of these commodities in India are grown round the year, given availability of light and lack of extreme winters. The crop rotation practice gave rise in PIRCOM Centres to a farming systems or cropping systems approach.

In the meanwhile, the first Education Commission (in Independent India) headed by the late Dr.S.Radhakrishnan had recommended the setting up of rural universities. When the report was being processed by Maulana Azad and Humayun Kabir, it was the time when the presence of US was strong in India. The British were withdrawing, and the US was taking their place in terms of academic partnership. This was also the time when Nehru visited the USA and talked of his "Discovery of America". The USA offered assistance in setting up the rural universities, redesignated agricultural universities, on the principles of the "land grant colleges" of USA. These universities were to be responsible for agricultural research, education and extension education. Thus the responsibilities till then with the State Government could be transferred to these universities. Starting with G.B. Pant Agricultural University in 1958, we have about 29 such universities today, many states having more than one agricultural university. Among these universities, none except the G.B.Pant University followed strictly the "land grant principle" whereby land was granted so that the university could derive substantial revenue from it to support its activities.

In 1957, the Rockefeller Foundation signed an agreement with the Government of India to promote research in maize and millets, and to set up a post-graduate school at IARI, Delhi. This school was set up after the model of an American University course-credit and trimester system, in-house examinations and so on - though some modifications were carried out, particularly in the examination system at the suggestion of UGC, which was then headed by Dr.C.D.Deshmukh. The Rockefeller Foundation gave strong support to P.G.education at IARI; some 5000 graduates would have come out of that school in the last 30 years. If one looks at Agricultural Universities now, one would find that many teachers there had been graduates at IARI.

The other important involvement of USA was in forming a review committee to look into the reorganization of ICAR. This was the Joint Indo-American Committee, which suggested conversion of ICAR into an autonomous scientist-oriented organization - to which the various Research Institutes like IARI, IVRI, NDRI as well as the PIRCOM Centres were to be transferred. The Commodity Committees were to be abolished and their research programmes were to be transferred to ICAR. The committee had also

recommended that the ICAR should be headed by an eminent scientist as its Director-General, assisted by Deputy Directors-General and so on.

When Subramaniam took over as Minister in 1964, his attention was drawn to the report of this committee, and he took action on it. In 1965, Dr. B.P. Pal took over as the first Director-General of ICAR. Dr. Pal strengthened the All-India coordinated projects which enabled every research worker concerned with a particular crop or topic to be brought together. Dr. Pal also strengthened the agricultural universities - most of them had an associate university in the US. (This arrangement was discontinued after the Bangladesh War of 1971). Such associations had some impact on agriculture here : for example, Jabalpur and Pant Nagar Agricultural Universities had collaboration with the University of Illinois, which brought its soyabean collection to India. This played an important part in the "Soyabean revolution" in Madhya Pradesh. When I took over as Director-General in 1972, after B.P. Pal, we couldn't carry on that kind of collaboration with the US. Their presence was dwindling; the Rockefeller Foundation left India. But we continued with our work in restructuring ICAR. The important change here was in personnel policies through the creation of an Agricultural Research Service (ARS). The first principle in ARS was to delink position and jobs, so that we could dissuade scientists from applying for jobs solely for monetary or position improvement. This meant a shift from a post-centred system to a scientist-centred system, whereby a scientist could be promoted to a higher grade if his or her work was good irrespective of the occurrence of the vacancies. The other was to assign the recruits to ARS work in neglected areas, ecologically and economically handicapped areas for a period of five years. The third aspect was to offer scope for continuous on-job training to stimulate professional growth of the individual scientists. For this purpose a National Academy for Agricultural Research Management was established at Hyderabad. The ARS was designed to promote pride in performance and greater endeavour. Its aim was to make solving a field problem rather than worshipping a discipline as the major purpose of applied agricultural research.

I have always held that personnel policies are the basic to the success and ethos of any research organization. Unless we are able to attract and retain good workers, sustaining research would be difficult. But offering financial compensation may not alone be adequate. Offer of continuous professional growth, enabling one to become part of a wider network etc. helps matters considerably. On-job training must combine both depth in a field with horizontal, comprehensive understanding. Scientists lacking in one or the other may not grow. The problem in ICAR was one of effecting shifts

in these matters: shift from discipline oriented problems to a problem-solving approach and from unhealthy rivalries and jealousies to cooperation.

At the level of universities, my aim was to help them perform more location-specific research. For this purpose, funds were made available to them with the help of a loan from the World Bank. Similarly changes in the National Demonstration Systems were brought about depending on what one wants to demonstrate.

All these efforts gave the ICAR a national presence. We also created at that time institutional structures that would look at the sustainability issue. Several bureaus such as the bureaus for plant, animal and fish genetic resources, land use planning etc. were created.

In the reorganization of ICAR, we of course did not keep any foreign organization as a model because our problems were different. The primary problem was to design a personnel policy which, given the paucity of jobs in our conditions, had to be different.

In this context, I may mention that I never believed in the concept of the "Centres for Excellence" - isolated islands of excellence. I believe that it is difficult to stay away from the national ethos, and that need not be attempted. The country's greatness consists in bringing up the average. Research systems cannot be organised to produce one or two outstanding individuals alone. It is not enough to have one farmer producing 15-16 tonnes of rice per hectare; the average national yield is still less than 1.5 tonnes and that must go at least up to 5 tonnes. Achieving that would be an indicator of the greatness of Indian agriculture, not isolated, splendid performances, though they point to the potential. In my own work in plant breeding I managed to shift emphasis from individual plant excellence to collective excellence - this I consider my important contribution. In the present day, individual performance is emphasized and competition is encouraged. But I have emphasized the collective; the team work. When I was with ICAR as DG we introduced awards for team work at Ph. D. level and at field level. We had even introduced self-assessment procedures for promotion, to cut down on unhealthy rivalry. But such measures have been changed today, under pressure from the demand for more pay and the UGC system has been introduced. The abolition of the scientist centred system of research management envisaged under the ARS will affect adversely the agricultural research system in the coming years.

The other systems of research organizations, CSIR for example, have often been the subject of reviews and the recent review by the Abid Hussain Committee had recommended very large scale structural changes. Have reviews of ICAR been carried out ?

There were two review committees. The first was the Indo-American joint committee which suggested radical changes, around which the reorganization of ICAR took place. The other committee headed by Justice Gajendragadkar suggested a change from an autonomous registered society to a Government Department. Shri Jagjivan Ram was the Minister for Agriculture then; he thought it wise not to convert ICAR into a regular Government Department. Instead, the Government decided to establish a Department of Agricultural Research and Extension and made the DG, ICAR concurrently Secretary of the Department.

How did you go about reorganizing the extension services, or the "delivery systems" as they may be called?

Prior to 1965, the extension work was carried out by extension agents, not scientists. This was over-hauled so that ideas would flow both ways, from lab to land, and land to lab as feed-back on field problems. The National Extension Service (part of the community development programme of the 50s) had block level workers called "gram sevaks", "sevikas" etc. but often they had little to extend by way of either new skills or inputs. In many cases these workers had become "Jack of all trades" at local levels, including fertiliser sale and trade - as somebody said that they had very little capacity for converting know-how into do-how. I believed in the value of sensitizing scientists to the rural reality and as a part of ARS probation, recruits were placed in rural setting for a few months. The Farm Science Centres (Krishi Vigyan Kendras) which we started in 1974 were aimed at merging the skills of the local population with the new technology. Beyond this I was not involved in the reorganization of extension services. That was carried out by Raja of Nalagarh and others.

What do you see as the role of economics - the role of incentive prices in influencing farming?

As I said, once the first priority of home needs is satisfied, the farmer keeps the rest for marketing. Market thus comes to influence his decision-making, even prior to the beginning of the season. That's why support prices are announced before season. Depending upon the expected returns, the farmer is prepared to cultivate anything,

rice, wheat, bananas or bamboos. For the farmer, net income is what is important. I have been referring to this as "net take home pay", on the analogy of the salaried class.

Previously, the credit for farming operations came from the moneylender, to whom the produce was often hypothecated. So, we needed a system which would break the money-lender- merchant nexus, which would go direct to farmer and procure the produce from him. This was the role played by FCI; without FCI, even the mechanism of price incentives may not have yielded results. NAFED has been playing a similar role in the case of soyabean, potato etc.

The prices are to farmers what fertilizers are to crops. This is the reason why leaders such as Sharad Joshi or Tikait have emphasized the need for higher prices. But the stimulation through higher prices may be applicable only to households which have a marketable surplus. Out of about 100 million operational holdings in the country probably 25 million have adequate marketable surpluses to benefit from higher prices alone. For the other 75 million, we need greater opportunities for off-farm employment and incomes.

You have been arguing for the need to conserve biological diversity at all levels to preserve the biological potential. Creation of centres where germplasm can be stored and conserved is thought to be one of the best ways of going about organising such genetic conservation. Do you think it is possible for us to evolve in this country, on our own strength, a system whereby germplasm not only from this country but from various places over the world can be preserved?

Following the corn blight epidemic in the early '70s in the USA, the National Academy of Sciences set up a committee (1972) to review the situation relating to the diversity of the genetic material in widely cultivated major crops. The committee found that the genetic diversity of many of the important crops in the USA was dangerously narrow - 95% of the groundnut crop was confined to only 9 varieties! Today, only about 150 plant species with about a quarter of a million local strains are important in meeting the calorie requirements of human populations. With the spread of high-yielding varieties of crops, the existing variability is under threat of extinction. The consequences of such a loss can be serious. To prevent such a possibility, action and support need to be organised at professional and political levels. In India, we do have the professional skills and competence needed to organise such a germplasm collection. The political will needs to be forthcoming. What it may take to organise such a collection would

only be a fraction of the cost of, say, putting up a nuclear power plant. Professional aspect of the task is not lacking in this country. Besides political will and professional skills, there is need for widespread public awareness of the problem, and the need for development without destruction.

You have been talking of ecological security, and sustainability of agricultural production, as early as 1968 as well as recently. Given the food situation in the country, where the demand is expected to be of the order of 300-400 million tonnes in the next 10 years, how could we achieve that kind of increase?

It is possible to achieve this using sustainable agriculture, but it will be a long and slow process. According to some farmers who have been practising this type of farming, it takes six to seven years to effect the shift over from chemical farming to ecological farming. The present average yield of cereals, particularly wheat cannot be increased much further. So the average productivity, which is about 2.5 tonnes must go upto 5 tonnes per hectare. This way we can meet the demand. China, with less available land per capita is producing over 300 million tonnes food grains already. We must achieve this with sustainable agriculture methods - crop rotation with legumes, green manure, integrated pest management and nutrient supply and so on. The older technologies of intensive fertiliser application etc. will not work. The strengthening and spreading of the land saving agriculture is an ecological necessity. The next phase must be brought about by "green" or environmentally friendly methods.

An important requirement for this technology would be consolidation of fragmented holdings. We could have some thing like a "Food Security Act" which would stipulate both an upper limit as well as a lower limit on the sizes of holdings. There should be methodology for determining the minimum size of holdings based on productivity or the income out of it that can be assured. It is not possible, nor is it necessary to give land to everybody. It is not done even in China, where a good fraction of the rural population is engaged in providing services for farming activity. Our criterion must be the assurance of a minimum income necessary to have a secure life. To achieve these goals, the extension services also must undergo reorientation. There should be farmers' own extension services, while the Government may only offer training. The ecologically sound technologies require groups rather than individuals to be targeted. This must become a characteristic of the new extension services.

Let me conclude by saying that agriculture is the foundation for food, economic and livelihood security. To achieve sustainable advances in biological productivity, we should arrest any further erosion in the biological potential of the soil, prevent the unsustainable

use of ground water and promote the conservation and use of biological diversity. We must capitalise on our human and ecological strengths and use better our coastal and mountain ecosystems. We must spread knowledge-intensive technologies and end the prevailing mismatch between employment opportunities and employable skills among educated youth. If agriculture goes wrong nothing else will go right.

Bibliography

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2. "Building a national food security system" (1968) reprinted *op.cit* pp 1-22 (the issue of ecological security is discussed)
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THE RESERVATIONS

The Government Order

Based on the recommendations of the Mandal Commission the government has ordered 27 percent reservation in jobs of the central government and public undertakings of the centre, for people belonging to socially and educationally backward castes. These are the popularly known middle castes or peasant castes.

The argument is this: these reservations are not for economic betterment. These are meant to enhance social respectability and create attraction for education among the backward castes, so as to take this society toward eradicating their social and educational backwardness.

It is true that the order came very suddenly. It was not on the agenda. But this may also be true that it would not have materialised had the then ruling party first tried to discuss its implementation with other parties. It may even be seen as an act of sheer political opportunism dictated by electoral calculations and needs of handling peasant opposition. But this is what today's politics is. And what if it proves to be the starting point of a grand success story.

The Opposition

Students are spearheading the opposition. In a careerist world in which bulk of the opportunities lie in government jobs, the interest of the upper caste student have obviously been affected. And upper caste students are the great majority in universities and colleges in the metropolises. So it is notable that the opposition is concentrated in large cities and big universities. Students of professional colleges and those with background in English have been most active. Delhi has taken the lead. Even placards were in English. This in a way shows the strength of the entrenched classes. However their cause is genuine and the government is responsible both for the damage to public property and casualties due to police firing.

The Federation of Indian Chambers of Commerce and Industry (FICCI) has also opposed the reservations. They are surely not an affected party. If at all, they stand to gain for such a measure is likely to divert merit toward private business. FICCI's opposition only shows the combination of caste and class in the ruling formations of this country.

Opposition by teachers is opportunistic too. Most of them have entered their present profession through invisible reservation channels through the use of money, kinship and other forms of social power. Those who could never raise their voice against capitation fee are today opposing the caste based reservations.

Almost all the political parties had approved the Mandal Commission report. They are opposing today its implementation in the name of economic criteria and in the name of saving the nation from being divided on caste basis. The truth is that the manner of its implementation has hurt them politically.

The Issues

- (1) The chief argument of the opposition is that such reservation disregards merit, and this is undesirable in absolute terms. It is also argued that giving back seat to merit shall adversely affect the national development. Money and kinship have been violating this merit for long but that obviously cannot be an argument for its further violation. But if this merit has been in the service of the nation for last 40 years, if this merit has been the basis of all development since Independence then perhaps there is reason to doubt its credence. One wonders whether it is in spite of this merit that our educational, administrative and industrial structures are dysfunctioning the way they are or is it because of this merit which partakes neither of social commitment nor of any moral standards. Merit so conceived is a non-moral, non-social, non-national concept. Such merit is in fact only a smoke screen for collecting the spoil of the system, at present the government jobs. If merit had ever been the criterion then the traditional craftsmen would never have been neglected. Is this merit not strange, respect to which has amounted to the emasculation of all traditional skills. Agriculturist, blacksmith, potter, weaver name any, and the skilledmen shall be found hard up for two proper meals.

This system has never been based on any genuine merit. Only those are considered meritorious who can to some extent manage to operate an imported system of administration, industry and education etc. Considerations of this merit shall always keep the bulk of the Indian population outside the privileged functions.

- (2) It is being charged that such a reservation shall divide the whole society along caste lines. The point is that this society is already divided along caste lines. The upper castes are occupying the positions of privilege and this has divided society oppressively along caste-lines. It is only when privilege in society shall be evenly distributed and not be a monopoly of some castes, that the oppressive character of caste-divisions may be reduced or ultimately eliminated. If reservations lead to clashes among castes and even to caste-war the responsibility shall rest on political opportunism and the privileged castes and not on backward castes.
- (3) Consideration of economic criteria is well in the debate because it is being pushed by major political parties. They want some kind of economic ceiling on eligibility for reservation. It is said that if such ceiling is not imposed poorer people will not benefit at all and all the places shall be cornered by some advanced sections, in the 3 or 4 major backward castes. This is true, this is what will happen. But the point is that this reservation policy is not for economic uplift, it is not a policy for eradication of poverty, its considerations are social in nature. It intends to break the monopoly of power and privilege of certain castes. Without the economic ceiling power shall go to castes which are already contending for power. This irks the powers that be. Inclusion of lower sections into power structure does not effectively challenge anything. Also if economic ceiling is imposed perhaps it will not be possible to fill the 27 percent quota. One should not be surprised if this is a concealed consideration behind the proposition.
- (4) Sri Vishwanath Pratap Singh is being attacked for unbounded political opportunism. He is being charged that such an important policy measure is announced only to take care of opposition within the ruling party and from outside and with an eye on elections. All this may be true. But all other political parties are playing an equally opportunistic game. Only, he seems to have beaten them all in this game at this juncture. Politics in this country today is another name of opportunism and between political parties there is little to choose so far as this is concerned.

The Debate

So, as we see, the issues are very limited. The concept of reservation is not attacked but only the present policy is questioned. The debate is limited to what should be the basis of reservation. What social and economic considerations should be there while determining the beneficiaries of reservations? So, there is discussion on reservation for

poor, for Muslims, for women etc. At the root of all this is a concept of backwardness which is shared by both the pro and anti-reservationists. Both agree that the peasant castes are socially and educationally backward and that for thousands of years they have been deprived of education and social status. Among the educated there is such remarkable agreement over this that one is forced to think that this must be either absolute truth or a total myth. This is what modern education has done to us, equipped us with a point of view which is based upon a total falsification of our history. The bare truth is that these so-called backward castes were socially respectable and politically powerful until the British changed this society from one based on agriculture and local self-governance to one worshipping modern industry and subjected to a totally centralised rule. It was this transformation which made the agriculturists, the artisans and the workers backward. Backward because the dominant world view sees human history in terms of a linear chain of events, Europe and America denoting the most advanced stages toward which all societies must gravitate. So by the same token by which we are a backward country, the labouring, cultivating and in general skilled castes are the backward castes because they are outside modern industry and education within this country. So the very concept of backwardness implies reservation. This is to bring in those who are left outside or left behind. But if we do not think in terms of being left outside or left behind, totally different solutions may come to the fore to remove a condition which is surely undesirable.

When people are left outside they should be brought in. This is effected by reservation in respectable jobs which bring them into the existing structures of social and political power. But another way to effect the same is by taking the social and political power to those who are left outside. By attaching greater importance to agriculture by making it more profitable and by political and economic decentralisation a far greater effect can be produced. Taking the people to the power structure is in fact the wrong way of doing it, it is the power structure which should be taken to the people. These are the two models which were in clash during the Independence struggle. One is the Westminster model and the other Gandhi's Swaraj. But this is not even in debate. However, to start this debate one will have to first understand that the so-called backward castes became backward during the British rule, they were truly the builders and rulers of traditional India. To take power structures to them is truly an act of historical justice and not an act of charity or political manipulation.

The other very important fact is that the middle classes are already pushed against the wall. The number of educated youth is constantly increasing and the job opportunities are limited. The basic and the widespread problem is that of employment, of respectable

sources of livelihood. Jobs can be generated in far greater number only through economic decentralisation, through a new industrial policy which envisages the far and wide spread of industry which is based on local resources, finance and skill, and not on import of the Western model. The industrial policy of new government is exactly opposite of this but not a word has been raised in opposition. It is only when students gather around such issues and demand a new education policy which is not just a third rate copy of a Western model, that a debate on genuine issues may take place. The opposition to reservation is showing no signs, so far, of snowballing into any such possibility, but it cannot be ruled out.

So the debate that has taken shape as a result of the present reservation policy is extremely limited. It is limited because it is being governed by the interests of very limited privileged classes. This also tends to govern the outcome or the consequences.

The Consequences

This is not to prophesy but to surmise on some possible outcomes of this reservation policy. We shall, therefore, in what follows discuss very briefly the social, economic and political consequences of the present reservation policy, if implemented as announced.

- (1) It will enhance the social respectability of these castes. Share in managerial and secretarial power is expected to have a chain reaction in two directions. One, the reach of these castes into unreserved areas of employment may increase and two, the scheduled castes and tribes may expect better treatment in corridors of power and in society. Atleast this is the expectation they seem to have while joining the pro-reservationists in the present divide. This is unlikely to promote casteism further. On the contrary it may ultimately lead to lesser and lesser caste considerations perhaps as a result of balance in caste power.
- (2) The direct economic consequence may not be considerable. Families that may have access to this reservation are unlikely to be from economically backward sections. But secondary and tertiary effects could be fairly large. Managerial and secretarial power in the hands of the middle castes may have a salutary effect in general on the economic condition of these and other lower castes.
- (3) The political consequences are most difficult to anticipate. Although it is not very likely, it is not impossible that the present opposition snowballs into something very big and destabilises the present polity. This can happen by challenging the role of political parties and their opportunism. It is particularly

possible if peasants especially from Haryana and Western Uttar Pradesh join the opposition. However the more likely result seems to be a stabilization of the polity. For more than twenty years now the polity has been unstable because of the rise of the peasantry and the backward classes, particularly of the North. This reservation may prove to be a turning point and start a process of adjustment which results in political stability. There are clear attempts at establishing an alliance between scheduled castes, tribals, backward classes, Muslims and also women. This is a political attempt for the purpose of elections. This coupled with the broadening of the ruling base may lead to some breakthrough in the party politics but it will essentially lead to political stability. The nation may be well on the way to modernization, not to look back again. But the above alliance is too potent and explosive to be contained by political manoeuvring; either it will break down before long or take the nation on an unchartered course, to destinies which are decidedly better than the present and not known or heard of in Western history or utopias.

Sunil Sahasrabudhey

Gandhian Institute of Studies
Varanasi

The Alternatives Decade and After

**A report on a get together sponsored by the PPST Foundation.
(Mahabalipuram, July, 1990)**

This July, the PPST Foundation had hosted a 2-day get together of various activists, thinkers and writers who have in the last 10-15 years been concerned with the issue of evolving alternatives in various spheres of our national life. The occasion was the completion of 10 years of the PPST endeavour. Dr.C.N. Krishnan, who initiated the event, observed that one of the purposes of the get together was to derive inputs which would be useful in steering the course of PPST in the future. This was one of the purposes of meeting. The other, perhaps more significant, purpose was to get the understanding of the participants on how the situation evolved in the past, and how it was likely to move in the coming few years. Each participant was requested to dwell on this large issue, from his/her experience or standpoint relating to a more specific sphere of activity, such as health or environment. There were about 40 people who gathered at Mahabalipuram and 17 talks were delivered. In the following pages excerpts from these talks are presented. The arrangement of excerpts is different from the order in which the talks were delivered. The meeting was a flexibly structured one, to enable maximum level of interaction to take place. In reporting the presentations by the participants, a rearrangement in the order was felt necessary to take the issue from one of evolving alternatives or new efforts in the sphere of S & T, to large social movements.

Jhumur Lahiri

Since the last few years, partly on my own and partly through the inspiration from PPST, I have been observing the traditional steel making technology in the Telengana region of Andhra Pradesh. The manufacture of the high quality "wootz" steel had been practised in this region by artisans till the early part of this century. My close

observations on the extant process revealed to me the complexity and the scale of operations involved, and the creativity of the artisans that goes into sustaining them. I was particularly interested and impressed by the design of the crucible used in this process - how a seemingly simple device is used to produce or maintain output characteristics over several production schedules.

The emerging national steel industry of the 'twenties in this century seems to have been bothered more about capital etc., than about the involvement of such artisanal skills and creativity in the process. Because of such trends overall, we have moved into a situation where technology import has come to be considered imperative in various contexts. We now have the spectacle of highly trained Indian engineers in a number of R&D organisations merely copying down the blueprints of a technology or a process developed abroad. That's our level of creativity now. How this deprives us of developing new initiatives in technology can be gauged from an example I've come across: in aircraft manufacture (for defence) certain types of rubber gaskets are used. Now, these are manufactured in India, but both the dies (for gasket manufacture) as well as the rubber needed are imported. The pretext is that this is part of the deal!

So, this issue of self-reliance in the technological sector is becoming important. The present method of project mode of funding technology development is totally inadequate. There is need to develop an integrated approach to technology development. Two important aspects which also need attention are the culture of the R&D lab., in India and the hierarchical structure that has come up. The present day culture of an R&D lab., is highly un-Indian, and tends to have a negative impact on the potential of the scientist. The hierarchical structure, the officer approach, divides the scientists and the technical assistants, preventing the much needed creative interaction. These issues must be addressed along with the more fundamental issue of the current design philosophies followed, which are inspired from the West; how to evolve a design philosophy rooted in our own context also needs to be addressed.

We have been involved in tackling the foundational, philosophical problems related to science in India and have not paid much attention to such issues. We must begin addressing them side by side our concerns in philosophy. The task initiated by PPST should not be limited by the perception of S&T in India as a monolith. It isn't and the task must be carried out at different levels simultaneously.

S.Arunachalam

I have started out with the problem: if Indian scientists are doing work of quality, should they publish their findings in outstanding journals abroad, or should we establish journals in India which can carry such findings. In India, we have a record of running good scientific journals. C.V. Raman established the Proceedings of the Indian Academy of Sciences in the Thirties, which had a reputation in the international scene for over two decades. *Sankhya*, which is published from the Indian Statistical Institute, is also known to be one of the finest journals in statistics in the world, and is a mark of the excellence achieved by the statistical scientists in India. Having a good journal in India will encourage one-to-one interaction among the practitioners by providing the necessary forum. This will considerably help in tackling the perceived lack of confidence among Indian scientists.

After 1970, when Raman passed away, those in charge of the Academy could not figure out how he had operated the journals of the Academy. He had operated them successfully, but had not told the method to any one! So, it was decided to bring in professionals to run the journal and that is how my own association with the Academy started. Between 1972 and now, the Academy launched publication of *Pramana* and *Journal of Astronomy and Astrophysics* both of which are rated among the better journals published in this country. Recently, *Current Science* founded by Raman along the lines of *Science* and *Nature*, has also been reoriented to make it the kind of multi-disciplinary journal that it was intended to be. In all these efforts particularly in the case of the *J. Astronomy & Astrophysics*, the involvement of extremely capable scientists has been crucial in ensuring their success.

In India, we now have a large network of institutions involved in academic research but the scientists here generally have few channels to publish their results. The existing system of peer review in Indian journals is inadequate, because there is no interaction even amongst practitioners in the same discipline. Such lack of interaction, or knowledge/information concerning the work of others in the field is a serious hindrance in raising the standard of peer review, and the quality of the journals. The situation worsens when good papers are published abroad, depriving the Indian scientists of a chance of a good interaction. Among the journals published in India by the Academies/professional societies, for-profit publishers and by the research organisations such as CSIR or ICAR, the first type are among the best; this is because of the very nature of the involvement of scientists in them. The chances of quality change/improvement in such journals are high. This is despite the tendency in some academies

to turn them into private preserves, despite the known inability of the scientific community to evolve policies to govern itself!

I have noticed that the concept of using large funding to direct or improve the quality of research is not quite a workable one. This became clear to me when I performed a study of the publication output of research projects in physics/chemistry/lifesciences, funded by one of the largest agencies under the Union Government. Given our many other inadequacies, such as the defective award/reward system, it would not be easy to expect such efforts as funding alone to influence the rise of quality in Journals in India. It is my belief that voluntary effort, outside the government system of research organisations, has considerable potential in this respect and may be more fruitful.

S.N.Nagarajan

I consider myself an Eastern, or an Oriental Marxist. I am concerned about the verdict that modern science & technology has passed on us in the Third world - that our culture is useless, our science is useless, administration is useless, even we are useless. Modern science and technology, especially in the post-world war II phase has acted more openly as a wide ranging instrument of imperialism. It has carried in it immeasurable capacity for inflicting damage, both internal and external. But today it is being challenged by the rise of various protest movements, feminist movements, alternative life styles movements and so on. Unfortunately, intellectuals in India have not shown any inclination towards building up such movements here. On the other hand, the marxists here term them reactionary and work against them. This S&T 8is poison;and it is entering the body, the body politic. What we need now is a "Neelakanta" model, whereby the spread of poison is arrested right at its entry. I am distressed to see that it is allowed to spread instead, but am convinced that what the dominant classes failed to check, the ordinary people will be able to bring under control.

C.V.Seshadri

I would like to title my talk "looking back, looking forward". As a practising scientist, I believe scientists in India have failed in their responsibility of interpreting their own work to the people. The politicians, and the media have taken upon themselves this task. As a result, we have things such as "Science, Engineering & Technology" columns in dailies such as *The Hindu*, communicating to a larger audience what science should not be, containing nothing Indian. (I use "science" and "technology" interchangeably). Or we have a "Science, Technology & Electronics Department" in the state of Tamil

Nadu, partly because some of the leading politicians here wanted to control TV, and thought TV was electronics and vice versa. Ultimately, science in India is communicated popularly through books such as the "Tao of Physics" or the "Dancing Wu Li Masters", and that's a rather sad situation.

So, I ask myself: do scientists in India understand science; I believe even they don't understand. Part of their problem is the English language in which the scientists are taught and trained to think. Usually, they think that this is really no problem at all but it is indeed a difficult problem. The semantic barrier to comprehending the nature of science is indeed formidable. There is a large, over-arching view of what science is - what is the nature of this knowledge, is it temporal or absolute etc., but questions of this kind are not addressed in our country. As a result, when a number of decisions affecting millions of people are clothed in the transparent layer of science, there is really no questioning in this country. There is, among scientists, no feeling of responsibility towards such decisions. How do you explain otherwise the complete disregard shown for the warnings of Harsh Gupta or V.K. Gaur in the matter of construction of Tehri Dam. I can quote my own experience: when I talked to a member of Planning Commission that electric power contributed only 3% of the total useful energy in this country, and that the proposed investment of over Rs.1,00,000 crores will not enhance this proportion over 4%, he said he knew it! This indifference arises because we have confused in our mind energy with electricity, and have not clearly enunciated for ourselves the aim that developing energy sources should be to generate more employment.

An allied problem is the lack of confidence among scientists when they double as policy makers. All we are prepared to do is "to demonstrate", "to conduct trials", to "show off" to the white man - to prove to ourselves that we know his game. New ideas are not pushed enough; they are at "pilot stage" or at "demonstration" because there is real lack of confidence. There was a time when we thought we didn't have time to learn - we had to "catch up", but that kind of approach never worked. We must realise now that Indian scientists or engineers must learn the new techniques themselves before it is imposed on them. But we often encounter the attitude : why reinvent the wheel; we need to because we need to write the manual for it. In the absence of such attitude, we have always been ridden with defective technologies from the West, which are full of gaps by design, so that we would be constrained to go back to them. We need to feel far more confident in handling such situations. The Indian mind is "colonialised" and this is time to correct it.

We must realise that this is a unique country; it has unique size, numbers, and has unique problems but we are not prepared to accept the responsibility for our own uniqueness. On the other hand, we have designed methods to run away from this country - most of our elite's sons and daughters are settled abroad - when we find things getting to be difficult. Unless this changes, there cannot be any real scope for improvement. We cannot maintain links like this; we cannot follow the model of any other country, nor should we be interested in offering models to others. We must comprehend our own unique situation, and I believe cutting India off from the rest of the World would be a first step in achieving this. We need to pause and think before we proceed, and such isolation is essential in our context.

Darshan Shankar

When one looks at the health sector in this country, one notices that the modern health care system extends to less than 30% of the population, nearly 70% of whom depend upon Lok Swaasthya Praramparaas (LSP) for their health needs. At the structural level, the referral service system may be considered adequate, but at the primary health centre level the structure is weak and is monopolised by the allopathic system. This needs to be changed. There is excellent service being performed by practitioners of certain types of indigenous medicine, as, for example, in bone-setting or in respect of eye disorders. Such work, an outcome of living *guru-sishya* tradition, has been rated high in quality even by allopaths who are usually hostile to or at least skeptical of these practices.

One may discuss the manner in which the LSPs can be appropriately recognised for their practical worth. But we notice that the current trend is towards "integration" of traditional medical systems with allopathy. This kind of a proposal, much floated about presently, has certain serious weaknesses. The primary one is the way the allopaths or experts in Western medicine conceive of the effectiveness of a particular drug or treatment. This is usually effected through a statistical model and there are many such trials sponsored by the World Health Organisation (WHO) to test the effectiveness of indigenous medical systems. Such trials have often ended in failure, for they do not capture the variability in preparation between practitioners and so on. This aspect needs to be critically examined. The other is the need to encourage dialogue between practitioners of folk medicine and those of Ayurveda. Such efforts will take us a long way in securing the LSPs, their deserved position in health care in this country.

We could start by looking at the energy situation in the country. Seshadri talked of the obsession that our planners have with producing electric power. This kind of skewed allocation of resources results in a situation which is like a war on the poor people in this country. With such attitudes, and with notions such as the necessity for building larger and larger thermal power plants, we are entering a phase where we tend to create a "Third World" of our own. But the final aim is to bring in nuclear electricity at any cost. For example power generation is stated to be one of the important aims of the Narmada Sarovar Project. But it is clear to me that within few years, due to competing demands, less and less water will be available for power production and so that would become another plank to justify the introduction of nuclear power.

On another plane, many of the present developments have tended to bring out clearly the relationship between energy and survival of the population. The lack or dwindling supply of biomass for fuel, the reduction in soil quality which prevents augmentation of biomass use etc., have pointed to the fragility of the energy support system in survival. In such situations, the lure of nuclear power might become more pronounced.

But developments over the last decade have revealed that there is a breakdown in the consensus on technological issues. Ten years back, there was a consensus, at least within the scientific community, about the need for nuclear power in India. Such a consensus cannot be said to exist anymore. Further, the people, the affected population, have become aware of what is being done to them. They no longer are taken in by statements about the employment generating potential of a highly polluting technology. For example, near Kota (where the R.A.P.S. is located) reactor, there is a village where a disproportionately large number of children have physical deformities. And the residents of the village are aware that the local radiation could be the cause of this. They admit to this despite the DAE being their sole employer. The causal connections are visible, but there is also a sense of helplessness. Similar is the awareness and feeling towards technologies which tend to physically displace a very large mass of people, by taking away their land.

Perhaps sensing this, stronger laws are being formulated and used against dissent movements in the name of combating terrorism. For example, TADA, which was brought in on the pretext of containing terrorism in Punjab is increasingly put to use in Gujarat, against anti-nuclear activists. There are also terror campaigns by the state

machinery, aimed at intimidating the local population so that they will not cooperate with the activists.

The channels and sources of support for protest movements are being narrowed down considerably by governmental action. Foreign financing is available to gain popular support and availing this immediately channelises the protest movements in a particular direction. Often, the life-styles of activists are used as a vested interest to achieve such an end; this suits the purposes of the government also. We talked of the need for technological self-reliance, and there is need for caution on the protest front also; there is need to be self-reliant in protest.

Ashok Jhunjhunwala

The PPST effort was founded ten years back and I have been associated with it for a considerable length of time. In the last two years or so, there has been some questioning within PPST, a sense of dissatisfaction - we have done so much so far, what next. There may be various approaches to answering this question and I shall provide a personal view.

One of the principal concerns which motivated our effort was the lack of functionality in the modern sector of national life in India. This still remains a concern, and I notice it among my colleagues in the IIT system too. I shall talk only about the modern sector in India, because I'm reasonably familiar with it and have been in the IIT system which is a part of it.

The situation of the IITs today is an example of the kind of situation that the whole modern sector is placed in. At the time of Independence and into the fifties, there appears to have been a feeling that collaborations with foreign countries were necessary to promote industrial growth in this country. The IITs were founded in the notion that they would provide adequate training to create manpower, which would help overcome the need for collaborations. But even after three decades of IITs and four decades of independence, the collaboration tendency has not been checked and is flourishing, in fact. The IITs appear to have provided good training, but the utilisation of such training to promote technological self-reliance has not been taken up. It appears to me that these institutions are not perhaps capable of achieving such a goal of promoting training and research for technological self-reliance. This is so in spite of commanding huge resources. This to me is an example of the dysfunctionality of the modern sector in India.

Radical transformation or restructuring of such institutions may be proposed, but pending that I believe functionality must be demanded of them. We must demand from them responsibility to the aims of self-reliance in technology. Their present record in terms of providing useful designs or products to the manufacturing or industrial sector is not worthy of mention, and fulfilment of such a function must be demanded. The people who man such institutions now do not feel confident, and seem to feel helpless. Helplessness coupled with command over huge resources may only result in callousness and that should not be allowed.

Raising this issue, I believe, will enable us to interact more meaningfully with the scientific-technological community. We in PPST have raised some major philosophical and conceptual questions on the nature of science and technology and its roots in the Western civilisation. But we seem to be unable to proceed on the basis of raising these issues alone. True, today many more colleagues are prepared to listen to these issues than there were ten years back but that doesn't take us much further. So, a different approach may be useful. The people who man this sector now aren't totally dysfunctional; they can't be dismissed, and an interaction with them is necessary. Rendering their work relevant in some way will be an important activity, and should be recognised as such in the PPST effort. Unwillingness to take this up seems to have given rise to the impression of the existence of non-complementary lines of thought within the PPST, and that needs to be changed.

Navjyoti Singh

A serious debate between indigenisation and the liberal import of technology is as old as the nation state in this country. What is new in the present context? Why could not, in the earlier period, Indian nationalism extend to technology policy as well? It is my belief that such a total lack of commitment to indigenisation as we see around us now, is a direct outcome of nationalism which could flourish without faith in its own people, which rests its faith solely in "executioners" (that is, those who execute what is abstractly legislated). We must understand this large issue of the very nature of the "executive wing" before we can formulate a proper division between indigenisation and liberal import of technology.

The modern nation-state is founded upon the separation between the judicial act and the legislative act. However, in our civilization, the conviction is that the act of justice (*dharmanukula kriya*) alone can be the source of legislation (*vidhana*) of norms, institutions, and fruitful activities. All norms of behaviour and work and institutions (such as the

family, kinship, professions, community etc.,) are legislated through acts leading to *dharma* (justice). One of the most important features of this system is the power to administer punishment or correction (*prayascitta*) when a mistake is committed. Punishment itself is considered injurious to the person concerned if a *prayascitta* is available and can be performed. This function (of administering correction or punishment) is often assumed within a community or even family, leading to a system or state which is singular, universal in theory, but is decentralised in practice.

The modern Indian state has moved away from this, by effecting transfer of sovereignty from the individual to the state, which then takes over the administration of punishment, through its judicial wing. The legislative act (on the basis of delegation of power from the individual to the state) gets separated from the judicial act. A state which is an embodiment of this may not be perceived popularly as establishing *dharma* through its legislative acts, but the ideology of nationalism provides the justification or legitimacy needed.

Let us note that in India, production was carried out in jurally adequate communities. The overall polity domesticated and socialised a production process by instituting a community (*samaja dharana*) around it. The community then takes up the entire responsibility for that profession and continually demonstrates that judicious living is possible around that profession. No production process would survive if a *samaja* could not be instituted around it, by the actions of the appropriate personage (*apta purusha*) who have become authorities (*adhikari*) on that production process.

In Independent India, S & T has been legislated through the elitist model of state that we had received and as such had to be totally dependent on a managerial culture, characteristic of the executive wing. The science managers, in the image of pettier executives of legislation, have acquired some sort of immunity from public accountability. This can be corrected if we evolve a method to gather practitioners of technology in a forum, to constitute a community. Such a community should continually review the situation in the country and abroad with respect to that technology at least. Such an activity will confer on them the *vidhayaka sakti* (legislative power). This would be one way one can functionalise a community of technology practitioners. The emphasis here is that they should be made to feel capable of shouldering responsibility for that technology at least which they work on.

M.D.Srinivas

There are various visions in India of what science is or what constitutes scientific activity. There are conceptions which consider science to be something pure, ennobling, a pursuit of truth, something which gives us power over nature. Many such views are summed up in the attitude that "the scientist is a rishi", a phrase which was coined by an eminent Indian physicist.

The prevalence of such views, of science as a method of generating grand theories of the universe, leads to a critical view when evaluating the traditional sciences of India. For the past hundred years or so, we have been implicitly guided into such beliefs through the works of British scholars. Today, when a modern Indian historian of science assesses the achievements of Indian sciences, he finds them lacking in progress. For example, a senior mathematician in this country, who has been looking at developments in Indian mathematics upto 16-17th centuries, says that we had made good progress in the early period - progress that is considerably ahead of mathematics in the 17th century in Europe- but then we do not seem to move at all. Instead of creating newer and newer grand theories, our scientists seem to be indulging in petty things, like improving a whole host of calculations, and so on.

I understand the situation in Indian sciences as follows : the primary thought here is that the theories are human constructs expressed in human language. Human language, even when embodying the thoughts of great personages, carries ambiguity in it, thus reducing the value of the exactness. This is more visible over a period of time. Since a theory is dependent on compatibility with perception, *agama* (the words of authorities) and inference, often a theory is refined when newer observations are noticed. This is the general tendency, and indian scientists are careful not to tamper working theories with uncertain hypotheses, because they see the purpose of thier activity differently. It is not to construct only grand theories, but to aid activities in ordinary, practical life. So, far all appearances, Indian scientists seem to have worked more like the "normal scientists" who are working away at microfine details.

Thus, scientists in India traditionally may not have been "rishis" but this is what, to some extent, the British sought to achieve by creating a class of exclusive people whose speciality would be their exposure to modern Western Science. About 100 years back, many Indians who had been exposed to modern science did feel a strong commitment to its propogation in India, along with whole variety of myths that the West had built around it. Many scientific institutions created in India under the British

had "regeneration of India" as the principal objective. But this issue has not been examined - whether the model of theory system that would go on producing newer and newer theories of universe by the day, or one which would be concerned with the affairs of practical life. The faith in the former appears to have faded in the 'seventies, so it does appear viable to think that science in India today would be more fruitful if it evolved into its role traditionally assigned to it.

The sense of and the need for exclusivism that the British inspired in us continues to make us blind to the emerging trends, whereby it is becoming visible that India is coming into its own. One of the most crucial activities in science could be not to obstruct this emergence, but to enable it happen. We as scholars who dabble in theories of the West, need to enthuse the public that this is so and that it would happen. Many issues connected with Indian Resurgence have been put forward in the last 10 years but sufficiently large efforts have not been made to face them. That is going to be an important task in the years to come.

Claude Alvares

I have been concerned with the violence that we see around us today, and the role of modern science in perpetrating or sustaining it. My observation of the modern farming technology, the pesticide application for example, convinces me that modern science embodies the mass murder approach - kill and clear everything that you consider undesirable. Modern allopathic medicine, particularly the antibiotic therapy, is another manifestation of this approach, by formulating the outright elimination of all flora and fauna from the body. The school in our society reinforces such an approach and contaminates the children's minds with the need and correctness of using violence.

But science has gone deep into the psyche of our leaders and influences their vision of this society. Nehru was disgusted with Indian society, because he viewed it through science. So are many of our leaders today. There is this urge created by science to destroy nature and recreate as an order as we desire it - like "forests" are created from "jungles". The popularisation-of-science movements are only spreading this calamity, by denying the value of anything Indian.

Now, I am fascinated by the great sense of self-preservation and survival in this society which has kept it going under the onslaught of modern science. It has survived only in a deformed way, no doubt, but it has survived. Acquiring deformities is perhaps a way of hiding one's survival. When one sees tribals and those untouched

by the impact of modern science, one thinks that they do know the secret, but getting to know it from them is a closed avenue as far as we are concerned. So we will have to search for an answer on our own. I believe that the only solution would be to deprofessionalise oneself and live in complete harmony with nature, have unbridled interaction with nature. Personally this is what I have been doing. The PPST effort also has focussed attention on the destructive character of modern science, but in 10 years, time has come for PPST to take stock of their own contribution. Major changes are needed, may be through dramatic events or PPST may have to close down - this is my understanding.

Vasant Palshikar

I do notice that there is some sense of dissatisfaction within PPST about the endeavour, as, for example, it comes through in the talk of Ashok Jhunjhunwala. PPST has worked like a think tank so far, by offering to project ideas by which the people may benefit, while keeping distant from the people. It generally happens that many ideas generated in this way often do not enthuse people so as to make them seek guidance through such ideas. Then there is some dissatisfaction among those who generated these ideas. PPST appears to be in such a position.

I believe it would be useful at this juncture to take a cue from Mahatma Gandhi's method of organisation. When he was not activating, mobilising the masses of people towards a specific goal, he used the organisation to work amongst people, by carrying out constructive programmes, which had a wide range of activities related to welfare. PPST perhaps can evolve a constructive programme in a similar way. The capability of PPST as a group is wellknown, so it should make it easy to evolve constructive programmes. I could think of activities in the health sector (indigenous medical systems and their relevance), and farming (organic farming, permaculture etc) as possible areas where PPST could evolve constructive programmes. Adoption of a demonstrably different lifestyle may have to be an integral feature of the programme evolved.

Krishna Kumar

One of the principal concerns of mine is to rectify the lack of self-confidence that we see around us today. Often enough, we have felt distressed to find the conditions around us as they are, and have pointed to the lack of vision of those that wielded power. Many of us had and have the vision and the ideas. In the past 10 years, considerable amount of theoretical and analytical work has been done which has revealed

the soundness of the ancient or traditional systems. It is time to develop practical methods by which some of these ideas or techniques could be rendered effective. There are a good many organisations in this country which are dedicated to identical purposes, but which perhaps lack the necessary vision. One effort could be that some of us join such organisations to give them the direction we think we are confident of giving. Doing so, I believe, would be a reaffirmation of our commitment to these ideas.

I have personally been involved with the Vishwa Hindu Parishad and with teaching of Ayurveda. I am with the former in the belief that organising the majority community is an essential step in the task of organisation of the national polity. In Ayurveda, I had noticed that in spite of a very sound system of medicine, the quality of students it attracted was inadequate. The result is a ten year effort in innovative reorganisation of ayurveda and I am happy to note that significant improvements have occurred through this. These results suggest that we need to get considerably more practical.

Asha Kachru

Women in India experience Western technology as a means for power politics, as a destructive tool. In the rural areas, the modernisation policies followed since the time of Nehru, and more recently under Rajiv Gandhi, have led to such large scale deprivation, that the poorer people have to live in inhuman conditions. At least in Northern India, the technology of Green Revolution has impoverished poorer people further; the menfolk in this situation have left the villages, leaving women as sole bread winners in many households. The overall orientation of Indian economy has been designed to suit the commercial interests from the West, and this has resulted in destruction of the socio-cultural context of tribal and rural populations, particularly of women. Investment in crores in the name of "development" in westernised institutions (such as banks) does not bring back the human dignity that has been lost.

A point of considerable significance here is the existence of voluntary organisations in India, which work towards evolving technology alternatives so that ecologically sound practices may return.

I believe that for a peaceful, ecologically and environmentally sound world, an ecological and political perspective of building technology with a feminine value-orientation is becoming absolutely necessary. Inclusion of such a perspective in existing technical institutions must be aimed at as an objective.

S.R.Ramaswamy

While on the threshold of '90s, we notice that situation around us is chaotic; in most vital areas, only the form has remained while functionality has disappeared. Our priorities in ordering socio-economic development are mixed up : we have a fertiliser industry which is subsidised to the extent of Rs.4000 crores while small and medium farmers, who subsist on their own without fertilisers, are not given any benefit. All this is compounded by the continuing aggressive industrialism-in spite of Bhopal - and the obsession with six_percent growth rate. The State in India, in such a context, is seen increasingly seeking alliance with transnational corporations and supra-national surrogate governments like the World Bank, or the IMF. On top of all these, we have aberrations in the name of export policies -for example, an agriculture export policy under consideration aims to triple the value of such exports (of cotton, oilseeds, sugar) irrespective of the capacity to meet domestic demands. Or, take our soft stand on the threat that the USA held out in the name of "super 301" - we were more or less 'saved' by the intervention of Pepsico Corporation on our behalf, but as a consequence, we have drawn up a "new industrial policy" aimed at providing fresh avenues of liberalisation.

This, in brief, is the challenge. Voluntarism may counter this, but not on a fixed agenda, for that would be a contradiction. The welfarist approach in voluntarism - of duplicating governmental delivery systems - might, for some, constitute anti-development. The reformist approach of the Nav-nirman of the '70s or the Narmada-Tehri battles of the present, may have lost major battles but has scored significant small wins. But for these, the progress of anti-development could not have been arrested. Voluntarism has to continue to perform this function for a long time to come.

We must point to the need for introspection among voluntary workers. Many of the movements - such as the anti-Narmada, anti-Baliapal or anti-Kaiga - are viewed as local agitations rather than as symbolic movements against destructive development in general. The messages intended may be getting lost in harping on statistical detail or non-essential information. So, there is need to reflect on developing a total perspective. Without such a perspective, and lack of unified direction, the emergence of conceptual alternative is delayed and this failure may swallow up little successes.

The effort, therefore, should be to constantly enlarge the vision underlying voluntarism. The drawbacks in the voluntary sector are mainly the following:

1. Inadequacy in the understanding of the macrolevel ramifications of the present politico-economic trends.
2. Diminished radicalism because of State oppression and because of institutionalised functioning of voluntary groups.
3. Absence of structures for sustaining the spirit of idealism in voluntary workers.

We may have to reflect on these aspects to evolve fresh modes of voluntary work.

Tomy Mathew

The '80s have demonstrated to us that the age of mega-movements is over; the intervention by mega or super-personalities as a cause or mode of political change is not conceivable. What we see now emerging is the politics of resistance, the resistance movements, which are local and have local-specific character. The politics of resistance is not all negative; it expresses and embodies the awareness that, contrary to beliefs held earlier, people don't need specialists to save them, they need to be saved from the specialists; people don't need technologies to save them, they need to be saved from them. Such awareness is also the result of the failure of the mega movements of the '60s and early '70s to deliver them from an oppressive, dehumanising order. In another sense, they also go beyond the mega movements, because they reflect the awareness of a structural crisis in the civilisation. There could be two types of responses when faced with such a crisis: one would be go down to the very root of the problem in order to settle it, while the other would be to plead inability because the crisis is structural! The politics of resistance arises from the former kind of response. It is as if it arises in the kitchen, engulfs the home, and spreads into the locality. Thus even when the resistance movement remains local, it may express a very profound change. That, I believe, is going to be the trend of movements in the future.

J.K.Bajaj

When we got together some 10 years ago and started the PPST effort, we were perhaps more confident than we are now. It looked to us then that the problem of India was a relatively straight-forward one: the British conquered India, moved us away from our course; we had since been drifting. All that needed to happen was a change - switch off the influence created by the British, and we should be back on our course. What we do realise now is that the problem is not as simple. Many tendencies which we thought had been inspired by the British could have been part of us; they may

not indeed be alien. Only that certain tendencies inherent may have been emphasised by the British and become dominant.

When one examines data on villages of Chengalpattu district around 1770, one notices how meticulously organised the economic and social life had been. There are many details, which are not only taken note of but actively attended to, such as care of travellers, animals, the sizes of living spaces, water storage and so on. What one realises is that this was possible only because those who operated these, the local communities, were also the ones who built them.

This is precisely the antithesis of what is happening today: we, the elite, take on us responsibilities for doing things which are not really ours. For example, the people of India know how to produce enough grain to feed themselves, but we intervened and messed up things considerably. The net result of our intervention has been that a large number of people do remain hungry, while the government stocks pile up. One can consider many more such examples, which demonstrate the carelessness involved in running the affairs of the country. We could only say that when those who were only subservient take to wielding power, callousness would be the prevalent attitude. We have tended to take on more responsibility on us than we could handle, and the net result is neglect and callousness in the country's daily life. We could only do tasks that are enabling - only those efforts which generate options so that the people may choose from them what is suitable.

Sunil Sahasrabudhey

(See his article "Swadeshniti" in this issue).

About the Speakers

Jhumur Lahiri is a materials scientist with a government laboratory at Hyderabad

S. Arunachalam is Editor, Indian Journal of Technology, New Delhi.

S.N. Nagarajan is a marxist thinker and writer based in Vellore.

C.V. Seshadri is Director, Murugappa Chettiar Research Centre, Madras.

Darshan Shankar is with the Academy of Development Science, Karjat, Maharashtra and is a co-founder of the *Lok Swaasthya Parampara Samvardhan Samiti (LSPSS)*.

S. Gadekar is Editor, Anu Mukti, which is a journal devoted to raising public awareness on the nuclear issues.

Ashok Jhunjhunwala is with the Department of Electrical Engineering at IIT, Madras and is treasurer of the PPST Foundation.

Navjyoti Singh is with NISTADS, New Delhi

M.D. Srinivas is with the Department of Theoretical Physics, University of Madras, and is one of the founders of PPST.

Claude Alvares is a writer and author based in rural Goa.

Vasant Palshikar is associated with various environmental activist groups, is a writer on social issues, and is based in Poona.

Krishna Kumar is Director, International Institute of Ayurveda, Coimbatore.

Asha Kachru is with the Frederick Eibert Foundation, New Delhi.

S.R. Ramaswamy is Editor, Utthana, A Kannada social monthly.

Tomy Mathew is with Pata Bhedam, a fortnightly from Thrissur, Kerala

J.K. Bajaj, one of the founders of PPST, is Director, Centre for Policy Studies, Madras.

Sunil Sahasrabudhey is with the Gandhian Institute of Studies, Varanasi.

SWADESHI ACCORDING TO MAHATMA GANDHI

After much thinking, I have arrived at a definition of Swadeshi that perhaps best illustrates my meaning. Swadeshi is that spirit in us which restricts us to the use and service of our immediate surroundings to the exclusion of the more remote. Thus, as for religion, in order to satisfy the requirements of the definition, I must restrict myself to my ancestral religion. That is the use of my immediate religious surroundings. If I find it defective, I should serve it by purging it of all defects. In the domain of politics, I should make use of the indigenous institutions by curing them of their proved defects. In that of economics, I should use only things that are produced by my immediate neighbours and serve those industries by making them efficient and complete where they might be found wanting.

*From the Speech at Missionary Conference,
Madras, 1916*

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We are told that 85 percent of a motor car is made here, but the other 15 percent is the most important. Unless we can make a cent percent motor car, I prefer to go back to the Ox-cart age, rather than go in an imported car.

C.V.RAMAN

Convocation address at
IIT, Madras, 1966



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There is no sastra (science) without krama (systematic application procedures) and there is no krama without sastra. Only he who knows sastra with krama attains success in all endeavours.

Rasaratna Samuccaya of Vagbhata
Chapter VI, Verse 2.



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"Just like we cross the river with the help of the boat-man, however low his caste might be termed as, whoever be a learned person, we should learn all the good books with his help"

**Naladiyar, Tamil Anthology of Cankam Period,
Porutpal, kalvi (6)**



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*Ultimately the aim of Scientific Knowledge is to benefit
human life. So long as we deal with problems
which arise out of our environment,
you can never say that any particular piece of work
can be useless.*

C.V. RAMAN

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There will be no science in India if we continue to try rely on imported equipment for research work. I call it paying for our ignorance - nay paying for our incompetence. Science can and shall advance in very simple ways.

C.V. Raman

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